

Exhibit 2

Rebuttal Expert Report of Hal J. Singer,
Ph.D.

(January 12, 2018)

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NEVADA**

IN RE:)	Case No.: 2:15-cv-01045-RFB-(PAL)
)	
Cung Le, Nathan Quarry, Jon Fitch, Brandon Vera,)	CLASS ACTION
Luis Javier Vazquez, and Kyle Kingsbury,)	
on behalf of themselves and all others similarly)	
situated,)	
)	
Plaintiffs,)	
)	
vs.)	
)	REBUTTAL EXPERT REPORT OF
Zuffa, LLC, d/b/a Ultimate Fighting Championship)	
and UFC,)	HAL J. SINGER, PH.D.
)	
Defendant.)	

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

PUBLIC COPY - REDACTED

Introduction.....	5
Qualifications	10
I. Zuffa’s Economists In No Way Undermine My Conclusion That Zuffa Has Significant Market Power and That the Challenged Conduct Substantially Foreclosed Competition	10
A. Zuffa’s Economic Economists Fail to Undermine, and in Many Ways Bolster, My Indirect Proof of Zuffa’s Market Power	11
1. Relevant Input Market and Submarket	13
2. Relevant Output Market.....	23
3. Barriers to Entry.....	23
B. Zuffa’s Economists in No Way Undermine My Direct Proof of Zuffa’s Market Power	27
1. Power to Suppress Fighter Compensation	28
2. Restricted Supply of Fighter Services.....	34
3. Power Over Price and Power to Restrict Supply of Live MMA Events...	36
4. Power to Exclude Rivals.....	40
C. Zuffa’s Economists Do Nothing to Undermine My Conclusion That the Challenged Conduct Substantially Foreclosed Competition.....	42
1. Dr. Topel’s Critiques of My Foreclosure Calculations Are Without Merit	42
2. Dr. Topel Does Not Undermine My Conclusion that the Duration and Staggering of Zuffa’s Contracts with Fighters Prevented Meaningful Competition by Other MMA Promoters	52
3. Dr. Topel Does Not Undermine My Conclusion That Zuffa’s Contracts Were Coercive	55
II. Zuffa’s Economists In No Way Undermine My Conclusion That the Challenged Conduct Substantially Harmed Competition.....	55
A. Dr. Topel Concedes That the Challenged Contractual Provisions Restrict Fighter Mobility, and That Restricted Mobility Reduces Compensation and Facilitates Zuffa’s Exercise of Monopsony Power	56
B. Dr. Topel Improperly Discards Data from My Impact Regressions Without Any Basis In Standard Econometric Principles.....	58
1. Strikeforce Is a Valid Competitive Benchmark	61
2. The Chow Test Is Not a License to Discard Data.....	62
3. Correct Application of the Chow Test Shows Classwide Impact and Damages, As Demonstrated in My Initial Report and Confirmed by Additional Analyses.....	65
4. Dr. Topel Makes False Claims Regarding the Strikeforce Pre-Acquisition Bouts	66
C. Zuffa’s Expert Economists Falsely Claim That Wage Shares Play No Role in Standard Economic Analyses of Market Power	69
1. Sports Economists Commonly Analyze Market Power Using the Share of Revenue Paid to Athletes	72
2. Economists Have Also Studied Wage Shares in a Variety of Non-Sports Industries Including for Purposes of Assessing Monopsony Power.....	80

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

3.	Wage Shares, Not Levels, Are The Appropriate Dependent Variable For My Impact Regressions	86
D.	The So-Called “Corrected” Impact Regressions Submitted by Zuffa’s Economists Are Fatally Flawed.....	89
1.	Zuffa’s Economists Assume Nonsensically That Event Revenue Is Unrelated to Fighter MRP, Fighter Compensation, or Both.....	89
2.	Dr. Topel’s Only Attempt to Incorporate Event Revenue in the Impact Regression Assumes Away the Effect of the Challenged Conduct and Is Econometrically Flawed	92
3.	My Regression Model Continues to Show Impact and Damages Using Dr. Topel’s Own “Stratified Foreclosure Shares”.....	96
E.	Zuffa’s Economists’ Claims Regarding the “Win Flag” Variable and Other Control Variables Are Misleading and Incorrect	96
F.	Dr. Topel’s Critiques of the Rank-Based and Revenue-Based Weighting Used in My Analysis Are Without Merit	99
1.	Dr. Topel’s Critiques of Rank-Based Weights Are Incorrect.....	100
2.	Dr. Topel’s Critiques of Revenue-Based Weights Are Incorrect	103
G.	Dr. Topel’s Claim That My Impact Regression Results Are Driven By “Mechanical” Relationships Is Incorrect	107
1.	Dr. Topel’s Ad-Hoc Economic Model Fails to Prove a “Mechanical Negative Correlation Between Foreclosure and Compensation”	108
2.	Dr. Topel Fails to Prove that my Revenue-Based Weights Introduce a “Mechanical Negative Correlation Between Foreclosure and Compensation”	111
III.	Zuffa’s Economists In No Way Undermine My Classwide Proofs of Common Impact on the Bout and Identity Classes.....	113
A.	Zuffa’s Economists Fail to Rebut My Classwide Econometric Proof That the Vast Majority of Bout Class Members Suffered Impact.....	114
B.	Zuffa’s Economists’ Critiques of My Compensation Structure Analyses of Common Impact Are Without Merit	116
1.	Dr. Topel Misunderstands the Meaning of Compensation Structure in the Class Certification Context.....	117
2.	Zuffa’s Economists’ Critiques of the Compensation Structure Evidence Are Without Merit.....	118
3.	Dr. Topel’s Critiques of My Compensation Structure Regressions Are Without Merit.....	121
4.	Dr. Topel Presents Classwide Evidence Consistent with, and Reinforcing the Presence of, a Compensation Structure	126
C.	Zuffa’s Economists Fail to Rebut My Conclusions Regarding Internal Equity .	127
D.	Zuffa’s Economists Fail to Undermine My Proof of Common Impact on the Identity Class.....	127
IV.	Zuffa’s Economists In No Way Undermine My Aggregate Damages Calculations or My Evaluation of the But-For World	129
A.	Aggregate Damages to the Bout Class.....	130
1.	The Impact Regression Benchmark Is Sound and Reasonable.....	130

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

2.	The Zuffa Foreclosure Regression Benchmark Is Sound and Reasonable	131
3.	The Strikeforce and Bellator Benchmarks Are Sound and Reasonable .	132
B.	Aggregate Damages to the Identity Class	136
C.	Dr. Topel’s Critiques of My Construction of the But-For World Are Without Merit	137
1.	A Plausible But-For World Would Include Substantially Shorter Fighter Contracts, and Substantially Fewer Restrictions on Fighter Mobility	138
2.	The Most Plausible Damages Result Is The \$1.6 Billion Calculation Derived From My Impact Regression	146
V.	Zuffa’s Claimed Efficiency Justifications for the Challenged Conduct Are Without Merit	153
A.	Dr. Topel Provides No Evidence That the Challenged Conduct Increased Investments in Fighters Specifically or MMA Generally	154
1.	Dr. Topel Provides No Evidence That the Challenged Conduct Enhanced Investment.....	155
2.	Dr. Topel Provides No Evidence of Purported “Transactions Costs,” Which Have Not Prevented Co-Promotion in MMA or Boxing, or Competitive Matchups in Non-Combat Sports.....	161
B.	Dr. Topel Fails to Demonstrate the Challenged Conduct Permitted the UFC to Succeed by Procompetitive Means	167
1.	Dr. Topel Relies on Anecdotes, Conjecture, and Other Unpersuasive Evidence to Claim that the UFC Has Succeeded by Procompetitive Means	167
2.	Dr. Topel Admits That the Challenged Conduct Is a Barrier to Entry That Permits Zuffa to Exercise Monopsony Power	171
C.	That Other MMA Promoters’ Contracts With Fighters Were Sometimes Similar to Zuffa’s Does Not Demonstrate that the Challenged Contracts Were Procompetitive	172
1.	The Challenged Conduct Incentivized Other MMA Promoters to Adopt Fighter Contracts Similar to Zuffa’s “Industry Standard,” and Rivals’ Contracts Were Less Restrictive Than Zuffa’s In Practice.....	173
2.	Dr. Topel Assumes Incorrectly That Conduct Undertaken by a Non-Dominant Firm Is Necessarily Procompetitive When Practiced By a Dominant Firm.....	175
3.	Multi-Bout Exclusive Contracts Could Remain in the But-For World, Despite Dr. Topel’s Straw-Man Attacks.....	176
	Conclusion	178
	Appendix: CV	179
	Appendix: Tables	198
	Appendix: Materials Relied Upon	201

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

INTRODUCTION

1. I have been asked by counsel for Plaintiffs to respond to the reports of Professors Topel¹ and Oyer.² I have also been asked to respond to certain portions of the report of Professor Roger Blair,³ and to certain portions of the report of Elizabeth Kroger Davis, Zuffa's accounting expert.⁴

2. The opinions expressed in this rebuttal report reflect my review of evidence, data, testimony, and other relevant materials to date. I reserve the right to supplement or amend my opinions should new materials or information become available.

3. Zuffa's expert witnesses fail to undermine the conclusions of my initial report, and in several instances either concede key underpinnings of my analyses or do not attempt to rebut them at all. Zuffa's economists focus, in particular, on the impact regressions presented in my initial report. To review briefly, my impact regressions are designed to test the hypothesis that, as Zuffa locked up a larger and larger share of Fighters in long-term restrictive contracts, it was increasingly able to underpay its Fighters, relative to what they would have been paid in a more competitive environment. I tested this theory by examining the relationship over time between: (a) the share of Fighters who Zuffa has locked up in long-term restrictive contracts ("foreclosure share"); and (b) the share of revenue Zuffa earns from putting on bouts ("Event Revenue") that

1. Expert Report of Professor Robert Topel (October 27, 2017) [hereafter "Topel Report"]. The capitalized terms used in this rebuttal such as Challenged Conduct and Fighters are the same terms as those defined in my initial report.

2. Expert Report of Professor Paul Oyer (October 27, 2017) [hereafter "Oyer Report"].

3. Expert Report of Professor Roger Blair (November 15, 2017) [hereafter "Blair Report"]. Counsel has asked me to respond, in particular, to ¶37, ¶¶42-48, ¶¶73-74, ¶79 of the Blair Report.

4. [REDACTED]

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Zuffa pays its Fighters (“wage share” or “labor share”). The regression uses two sources of variation: (1) variation in Zuffa’s own compensation practices over time (comparing historical time periods when Zuffa was less dominant to more recent time periods); and (2) variation between Zuffa’s compensation practices and those of Strikeforce before Zuffa acquired it (comparing Zuffa’s compensation practices to those of a non-dominant rival). If the Challenged Conduct were not anticompetitive, the model’s analysis of Zuffa’s Fighter compensation based on (1) and (2) would not have yielded results supportive of my hypothesis. But they did: After controlling for a host of factors that could also influence Fighter compensation, my impact regressions found that, as Zuffa increased its control over the MMA industry by locking up Fighters to long-term exclusive contracts, Zuffa paid its athletes a lower wage share (relative to both Strikeforce and Zuffa itself historically). Thus, my central econometric analysis shows that Zuffa suppressed the wage share of Fighters as its dominance of the market increased, just as economics would predict.

4. This wage-share impact regression model served as the primary basis of my proof of common impact: The regression model predicts that Zuffa paid virtually all Bout Class members less than these Fighters would have been paid in the but-for world. In other words, this model is a class-wide method of proving common impact. My impact regression also demonstrated that the Challenged Conduct had substantial anticompetitive effects, and was one of the ways I computed classwide damages to each of the proposed classes (the Bout Class and the Identity Class).

5. With no credible basis for overturning the results of my impact regression model, Zuffa’s economists have focused on my use of wage share as the dependent variable in my estimation method. According to Zuffa’s three economists, the only appropriate means of

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

assessing the impact of the Challenged Conduct on Fighter compensation is the wage *level* (the amount of money Zuffa paid Fighters *measured in dollars*)—as opposed to the wage *share* (the proportion of event revenue Zuffa paid Fighters *measured as a percentage*). However, as demonstrated in detail below, my use of wage share is supported by, among other things: (1) the economic literature, which uses wage share in the exact same context (including most prominently in professional sports) as I do here; (2) the UFC’s own practices in that it used wage share in its ordinary course of business and in the preparation of its sale to WME; and, (3) Drs. Topel and Blair themselves, who have both used wage share as economic consultants. My use of wage share here is also consistent with the empirically and factually supported point that, as in many other professional sports, the athletes, here the Fighters, are the major draw for MMA consumers, and thus the main driver of Zuffa’s Event Revenue. Every expert involved in this litigation, including Zuffa’s, recognizes that revenue generation is proportional to athlete productivity. Thus, all else equal, if Fighter compensation fails to keep pace with the growth in Zuffa’s Event Revenue, that is evidence of the exercise of monopsony power. That is precisely what my econometric analysis finds.

6. Despite all this, both Dr. Topel and Dr. Oyer claim that only the *level* of Fighter compensation, even as Event Revenue grew dramatically during the relevant period, is the appropriate focus of economic analysis in this case. In doing so, they implicitly assume (nonsensically) that Zuffa’s Event Revenue bears no relationship to the productivity—indeed the revenue-generating power—of its own Fighters. This underpinning of their analyses contradicts,

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

among other things, elementary economic theory, standard practice in sports economics,⁵ extensive record evidence in this case, and their own testimony.

7. Dr. Topel does make one lone attempt to incorporate Event Revenue into his analysis.⁶ But, as explained below, that approach assumes away the effect of the Challenged Conduct: His analysis implicitly incorporates the assumption that the Challenged Conduct had *no effect* on the proportion of Event Revenue that Zuffa paid to its Fighters. In other words, he assumes away the very hypothesis that my impact regressions are designed to test. His attempt to incorporate Event Revenue also suffers from fatal and well-understood econometric flaws (including simultaneity bias), which are discussed below as well.

8. In addition to the rich empirical history and record basis for my use of wage share, wage share is an appropriate and well-recognized means of assessing the impact of monopsony power on the compensation of professional athletes from a theoretical perspective. To understand

5. To take a few of many examples discussed further below: Professor Scully, a pioneer in the sports economics field, explained in an article published in 2004 that “[w]hile all professional team sports had monopsonistic labor markets in the past, all have veteran free agency now. This change from a restricted to a free labor market...creates a natural experiment in which the effects of freedom of the market can be examined and measured.” In performing his analysis, Professor Scully calculated compensation *as a share of revenue* for Major League Baseball, the National Basketball Association, the National Football League, and the National Hockey League; for each sport, he found that compensation increased substantially *as a share of revenue* after free agency was introduced. Gerald Scully, *Player Salary Share and the Distribution of Player Earnings*, 25(2) *MANAGERIAL AND DECISION ECONOMICS*, 77-86, 77-78 (2004). Similarly, Professor Vrooman, another sports economist, explains that “[a]s the result of internal competition among sportsman owners, monopsonistic exploitation has virtually vanished over the last decade in all [major professional sports] leagues. All leagues have similar carrying capacities for player costs at *two-thirds of revenues* and current payroll cap percentages are almost identical at about 60 percent.” John Vrooman, *Theory of the Perfect Game: Competitive Balance in Monopoly Sports Leagues*, 34(1) *REVIEW OF INDUSTRIAL ORGANIZATION* 5-44, 42 (2009) (emphasis added). Professor Monks, another sports economist, explains in one of his academic papers the prominence of wage share in evaluating the degree of monopsony power being exercised by sports teams: “A common method of estimating the degree of monopsony control of an industry or employer is to compare the marginal revenue product of an athlete to his or her compensation. This exercise is fraught with difficulties and complexities under the best of circumstances, and clearly is untenable when considering millions of athletes across numerous sports. An alternative mechanism for establishing the degree of monopsony control *in a sporting industry* is to examine the *share of revenue* returned to the players. *Economists have often used the share of revenue returned to the players in the form of salaries as evidence of the degree of monopsony control.*” (emphasis added). James Monks, *Revenue Shares and Monopolistic Behavior in Intercollegiate Athletics*, Cornell Higher Education Research Institute Working Paper 155 (September 2013), at 3 [hereafter “Monks (2013)”].

6. As explained below, Dr. Topel includes Event Revenue as a control variable in some of his regressions.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

why, one needs to understand the basic building blocks of labor economics. Economists define the marginal revenue product (“MRP”) of labor as the increase to a firm’s revenues caused by the increase to the firm’s output produced by the last worker employed, holding all else constant. In competitive labor markets, economic theory shows that workers will be hired up to the point when a worker’s MRP is equal to the wage rate. In monopsony labor markets, by contrast, wages will be set *below* the MRP. That is so because the monopsonist faces an upward-sloping labor supply curve, meaning that the firm can push wages down (and generate savings across all employees) by restricting the number of workers it hires.⁷ If one could observe a Fighter’s MRP directly, then estimating the deviation of that Fighter’s wage from his MRP would inform the degree to which Zuffa exercises monopsony power over Fighters: The bigger the gap between a Fighter’s MRP and her wage, the more monopsony power the firm is exercising. However, as economists recognize, MRP is not directly observable. Fortunately, the amount of revenue generated at a Live MMA Event is a reasonable proxy for the MRP of the Fighters competing in that event. Thus, the next best type of evidence of Zuffa’s monopsony power is to examine a Fighter’s compensation as a share of Event Revenue (the wage share). And that is precisely what I did here.

9. In short, as discussed in detail below, on the central disagreement between the economists in this case—whether to estimate a regression using wage *shares* or wage *levels* as the dependent variable—Zuffa’s economists have made a fatal mistake. Their approach is inconsistent with actual business practices in the MMA industry, with the relevant applied

7. There is a direct parallel between a monopolist—a *seller* with market power—and a monopsonist—a *buyer* with market power. Just as the monopolist’s optimal markup over marginal cost varies inversely with the elasticity of consumer *demand*, the monopsonist’s optimal markdown below MRP is inversely related to the elasticity of labor *supply*. The solution to the monopolist’s problem of what price to charge is given by $(p-c)/p = -1/E_D$, where p is the price, c is the marginal cost, and E_D is the elasticity of consumer demand. By symmetry, the solution to the monopsonist’s problem of what wage to pay is $(MRP-w)/w = -1/E_S$, where w is the wage, MRP is the worker’s marginal revenue product, and E_S is the elasticity of labor supply.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

economics literature, with economic theory, and with proper statistical analysis. For these reasons, I was correct to use wage shares as the dependent variable in my regressions.

10. Further, as detailed below, Zuffa's economists fail to undermine any aspect of my findings and conclusions, including: (1) that Zuffa has significant market power; (2) that the Challenged Conduct substantially foreclosed competition; (3) that the Challenged Conduct permitted Zuffa to exercise its market power to substantially harm competition; (4) that the harm flowing from the Challenged Conduct was widespread across members of both proposed Classes and thus can be said to have caused common impact across each Class; (5) that aggregate are \$1.6 billion for the Bout Class and \$37.2 million for the Identity Class; and (6) that the efficiency defenses of the Challenged Conduct proffered by Zuffa and its economists are unavailing.

QUALIFICATIONS

11. My qualifications are contained in my initial report. In the interim, I have testified in a few new matters, which are summarized in my CV, attached in the Appendix.

I. ZUFFA'S ECONOMISTS IN NO WAY UNDERMINE MY CONCLUSION THAT ZUFFA HAS SIGNIFICANT MARKET POWER AND THAT THE CHALLENGED CONDUCT SUBSTANTIALLY FORECLOSED COMPETITION

12. My initial report used standard indirect and direct methods of proof to demonstrate that Zuffa wielded significant monopoly and monopsony power at least since the beginning of, and extending throughout, the Class Period. My analyses have all confirmed the evidence showing that Zuffa is widely recognized as the dominant promoter of professional Live MMA Events.⁸ My initial report also demonstrated that access to a broad stable of MMA Fighters is a critical input necessary to stage successful Live MMA Events, and that the Challenged Conduct substantially

8. Expert Report of Hal J. Singer, PhD (August 31, 2017) [hereafter "Singer Report"], Parts III.A-B.

foreclosed competition by ensuring that Zuffa's would-be rivals lacked access to this critical input.⁹ In this section, I explain why Zuffa's economists fail to undermine these conclusions.

A. Zuffa's Economic Economists Fail to Undermine, and in Many Ways Bolster, My Indirect Proof of Zuffa's Market Power

13. As explained in my initial report, a relevant antitrust output product market is comprised of a product or group of products such that a hypothetical monopolist that was the only present and future *seller* of those products could profitably impose a small but significant and non-transitory increase in price (the "SSNIP") over the competitive level.¹⁰ When it comes to input markets, market definition proceeds analogously: A relevant (input) market consists of a product or group of products such that a hypothetical monopsonist that was the only present and future *buyer* of those products could profitably impose a small but significant and non-transitory decrease in prices (or wages) below the competitive level.¹¹ The combination of dominant market shares and barriers to entry allows me to conclude that Zuffa possessed monopoly power in the Relevant Output Market and monopsony power in the Relevant Input Market and Submarket since at least the beginning of the Class Period.¹²

14. In my initial report, I define a Relevant Input Market of MMA Fighters, measured in two ways using industry-accepted databases.¹³ I also define a Relevant Input Submarket of Headliners, consisting of all Fighters ranked one through fifteen according to industry-accepted databases in any of the ten major MMA weight classes.¹⁴ I also define the Relevant Output Market as Live MMA Events in which the participating Fighters are in either the Relevant Input Market or

9. *Id.* Part III.C.

10. *Id.* ¶97.

11. *Id.* ¶98.

12. *Id.* ¶96.

13. *Id.* Part III.A.1.

14. *Id.*

the Relevant Input Submarket.¹⁵ My initial report demonstrates that Zuffa's Fighters account for dominant shares of the Relevant Input Market,¹⁶ the Relevant Input Submarket,¹⁷ and that Zuffa itself has a dominant share of the Relevant Output Market.¹⁸ With respect to the Relevant Output Market, I define the relevant geographic market as encompassing Live MMA Events in the Relevant Output Market broadcast in North America.¹⁹ With respect to the Relevant Input Market and Submarket, I also define the relevant geographic market as North America.²⁰ My initial report demonstrates that, at least since the beginning of, and extending throughout the Class Period, Zuffa possessed dominant shares in the Relevant Input Market and Submarket,²¹ and in the Relevant Output Market.²²

15. My initial report also demonstrates that rival MMA promoters face substantial barriers to entry and expansion in the Relevant Output Market, due in part to the Challenged Conduct, including Zuffa's staggered, long-term exclusive contracts with Fighters.²³ The combination of dominant market shares and barriers to entry allows me to conclude that Zuffa possessed monopoly power in the Relevant Output Market and monopsony power in the Relevant Input Market and Submarket since at least the beginning of the Class Period. As explained below, Zuffa's economists fail to undermine these conclusions.

15. *Id.* Part III.A.2.

16. *Id.* Part III.A.4.

17. *Id.*

18. *Id.* Part III.A.5.

19. *Id.*

20. I conservatively include ONE Championship in the Ranked measure of the Relevant Input Market even though it is outside of the Relevant Geographic Market. *Id.* Part III.A.5.

21. *Id.* Part III.A.4.

22. *Id.* Part III.A.5.

23. *Id.* Parts III.A.6-7.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

1. Relevant Input Market and Submarket

16. My initial report conservatively defines the Relevant Input Market and Submarket to include Fighters from many non-Zuffa MMA promoters.²⁴ I took this approach despite evidence showing that even the most prominent non-Zuffa MMA promoters are at best distant substitutes to Zuffa from the perspective of Fighters.²⁵ As a result, my analysis is conservative in the sense that it uses market definitions that tend to understate Zuffa's market power. The "Tracked" measure of the Relevant Input Market (which encompasses MMA promoters tracked by a third-party data collection source used by promoters and others in the MMA industry known as FightMetric) includes Fighters associated with eight MMA promoters in addition to the UFC.²⁶ The "Ranked" measure of the Relevant Input Market (which includes Fighters ranked in the top 650 in any of the fourteen MMA weight classes in the FightMatrix database, a different third-party database from FightMetric) includes Fighters associated with hundreds of MMA promoters.²⁷ The Headliner Relevant Input Submarket (consisting of all Fighters ranked one through fifteen in any of the ten major MMA weight classes) also includes Fighters associated with hundreds of MMA promoters.²⁸

24. *Id.* Part III.A.1.

25. *Id.* Parts III.A.1, III.A.8. My initial report follows the DOJ/FTC *Merger Guidelines* in defining the Relevant Input Market and Submarket based on the alternatives to which Fighters could reasonably substitute to counteract an exercise of monopsony power by Zuffa. *Id.* ¶¶97-99.

26. *Id.* ¶109, Table 2.

27. *Id.* ¶111.

28. *Id.* ¶114. Dr. Topel claims that I dismiss Bellator, ONE Championship ("ONE"), and the Professional Fighters League as "competitively insignificant." Topel Report ¶77. This claim is false. Although it is unlikely that ONE or Professional Fighters League has any real competitive significance for Zuffa and that Bellator likely has only slight significance, to be conservative, I nonetheless include Fighters from each of these promotions in one or more of my measures of the Relevant Input Market and Submarket: Fighters from Bellator, Professional Fighters League (rebranded from WSOF), and ONE are encompassed in the Ranked measure; Fighters from Bellator and Professional Fighters League/WSOF are included in the Headliner Submarket; Fighters from Bellator are also included in the Tracked measure.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

17.

[REDACTED]

29. Topel Report ¶31.

30. Department of Justice & Federal Trade Commission, Horizontal Merger Guidelines (August 9, 2010) §4.1.1 [hereafter, “Merger Guidelines”].

31. *Id.* §4.1.1; *id.* §12; *see also* Singer Report ¶98.

32. Topel Report ¶212; *id.* Exhibit 24.

33. *Id.* ¶¶208-210.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

18. Dr. Topel claims that the Headliner Relevant Input Submarket “conflates athletes’ ability with promoter acumen.”³⁶ This claim is both irrelevant to market definition and wrong. Even if his claim were true, it would not imply that a hypothetical monopsonist over Headliners could not exercise monopsony power. Supposing (counterfactually) that promoter acumen were the sole reason for Zuffa’s dominance of the Relevant Input Submarket, Zuffa would still dominate the submarket and would, as a result, possess monopsony power.³⁷

19. Setting this aside, Dr. Topel’s evidence of Zuffa’s “promoter acumen” is both inadequate and unpersuasive. It is inadequate because—even if Zuffa’s high share of the Input Submarket were indicative of Zuffa’s business acumen with respect to promoting fights and Fighters—it would not refute the record evidence and analysis in my initial report that Zuffa

34. Topel Dep. at 483:11-19.

35. Dr. Topel also conceded that there are vast differences in the value of professional MMA Fighters to an MMA promotion, including notoriety, rank, record, and other indicia of quality. Dr. Topel acknowledged that (a) on average consumers are willing to pay more to see matches between highly ranked Fighters, *id.* at 432:10-17, (b) on average higher ranked fighters generate more revenues when they fight than lower ranked fighters, *id.* at 432:18-24, (c) “not all fighters are exact substitutes for each other,” *id.* at 450:8-11, (d) “some fighters are more important to an MMA promotion than others,” *id.* at 450:12-16, (e) “some fighters generate more revenues when they fight” than others, *id.* at 450:17-19, and (f) fighters capable of generating more revenues when they fight, all things equal, are more valuable to their promotion than other fighters, *id.* at 450:20-451:5.

36. Topel Report Part C; *see id.* ¶¶213-217.

37. Indeed, Dr. Topel himself recognizes that “possessing monopoly or monopsony power in and of itself is not anticompetitive.” *Id.* ¶38.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

possesses monopsony power.³⁸ The point of defining a market is to determine whether Zuffa has market power. Dr. Topel's argument about "promoter acumen" does not refute that Zuffa has market power; it merely offers a potential explanation for how it acquired (or maintained) that market power. That Zuffa possesses substantial market power (whether obtained through skill, luck, the productivity of its Fighters, or other means) does not resolve whether its conduct is anticompetitive, nor does it address whether Zuffa's conduct has helped Zuffa maintain or enhance its market power. Those are separate issues. The Challenged Conduct is anticompetitive because, as shown in my initial report and below, it has allowed Zuffa to maintain, extend, and enhance its market power to substantially harm competition.³⁹

20. Dr. Topel's evidence of Zuffa's "promoter acumen" is also unpersuasive on its own terms. It consists solely of Exhibit 25 of his report, purporting to demonstrate that "Zuffa has a strong history of helping athletes develop from a low rank into the Top 15."⁴⁰ What the exhibit actually demonstrates is that, over time, an increasing percentage of Fighters who became Headliners at Zuffa were not Headliners when they first fought for Zuffa. But this is simply a consequence of the fact that, as Zuffa's share of the Headliner market increased, fewer and fewer Headliners were associated with non-Zuffa promoters (as the Challenged Conduct resulted in negligible opportunities for Fighters' career advancement at other MMA Promoters). Put differently, Dr. Topel's Exhibit 25 simply confirms that Zuffa's share of the Headliner Submarket has increased over time. That is entirely consistent with my own analyses and conclusions, namely that Zuffa possessed a dominant share of the Headliner Submarket, and that absent the Challenged Conduct, Zuffa either would have lost these Fighters to other MMA promotions or would have

38. Singer Report ¶5; *id.* Part III.

39. Singer Report ¶5; *id.* Part III. *See also* Parts I.C and II, *infra*.

40. Topel Report ¶214, Exhibit 25.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

been forced to pay them a competitive wage—that is, substantially more.⁴¹ Finally, even according to Dr. Topel’s Exhibit 25, between 21 percent and 49 percent of what Dr. Topel terms “Zuffa Headliner Streaks” during the Class Period involved Fighters who achieved Headliner status *before* they came to Zuffa.⁴²

21. Dr. Topel also claims that the Headliner Submarket “raises questions about the commonality of the proposed class,”⁴³ and that “any ‘impact’ of Headliner share tells us nothing about impacts on other athletes.”⁴⁴ That is incorrect. My impact regression, along with abundant other evidence, confirms that, by controlling Headliners, Zuffa was able to maintain monopoly power in the Relevant Output Market and monopsony power in the Relevant Input Market, and thereby suppress compensation to UFC Fighters generally.⁴⁵ Because being matched against other prominent Fighters is the primary career objective for an MMA Fighter (or at least the means of obtaining the primary career objective),⁴⁶ by controlling the top Fighters, UFC became the dominant destination for other Fighters.⁴⁷ Dr. Topel himself concedes that “[t]here is a *natural* tendency for a leading promoter to attract a significant share of the top athletes. This follows from the complementarity of athlete talents in producing high-quality bouts, and the desire among athletes to fight against the best....”⁴⁸ This tendency toward monopoly explains why the

41. Singer Report ¶5; *id.* Parts III.C-D..

42. Topel Report Exhibit 25, fourth column (displaying “% of Zuffa Headliner Streaks With Non- Headliner Rank at Time of First Ever Zuffa Bout”). This statistic ranges from 51 percent to 79 percent between 2011 and 2017. Therefore, between (1- 79) = 21 percent and (1- 51) = 49 percent of Zuffa Headliner Streaks involved Fighters who achieved Headliner status before coming to Zuffa.

43. *Id.* ¶218.

44. *Id.*

45. Singer Report ¶105, ¶¶112-114; *see also id.* Table 6, column (3) (showing that in increase in Zuffa’s foreclosure of Headliners suppresses Fighter Shares for UFC Fighters generally); *see also id.* ¶¶156-165.

46. *Id.* ¶20

47. *Id.* ¶105, ¶¶112-114, ¶¶156-165.

48. Topel Report ¶96 (emphasis added).

Challenged Conduct was particularly effective as a means to maintain market power: If the dominant MMA promoter could sign the vast majority of top Fighters to long-term exclusive deals, and (if necessary) acquire potential rival MMA promotions whenever a promoter seems to have amassed a core group of top Fighters, then that dominant promoter would be able to perpetuate its control over the Relevant Input and Output Markets. That tipping of the market is precisely what Zuffa has done here. And Dr. Topel himself has conceded that by having the vast majority of top Fighters under multi-fight exclusive contracts, Zuffa created an artificial barrier to entry for potential MMA promotion rivals.⁴⁹ The incentives pushing Fighters to sign with an MMA promoter who already has the other top Fighters also explains why a dominant share in the Headliner Submarket conferred monopsony power to Zuffa—controlling only the top Fighters would itself be sufficient to control the entire market, and thereby enable Zuffa to suppress compensation to all (or nearly all) of its Fighters.⁵⁰

22. My initial report explains that the Headliner Submarket includes the ten major MMA weight classes,⁵¹ and that this metric is conservative, because Zuffa has had a disproportionate share of Headliners within the most prominent weight classes that generate the most PPV revenue.⁵² Dr. Topel claims that the Headliner Submarket “artificially inflates Zuffa’s share of MMA athletes”⁵³ because it excludes four minor weight classes (men’s strawweight,

49



50. Classwide evidence of a compensation structure among Zuffa Fighters further confirms that suppression of compensation to some Fighters (such as Headliners), implies suppression to all or almost all Bout Class members. *See, e.g.,* Singer Report Part IV.B.

51. *Id.* ¶17, ¶99, n.268.

52. *Id.* ¶129, n. 351.

53. Topel Report ¶215.

women's featherweight, women's flyweight, and women's atomweight) in which "Zuffa has not traditionally participated."⁵⁴ Dr. Topel provides no evidence that a hypothetical monopsonist over most or all of the ten major MMA weight classes could not exercise monopsony power over Fighters unless the Relevant Input Submarket were extended to include these four minor weight classes. Dr. Topel also ignores that these four minor weight classes are not tracked by fan websites such as *USA Today/MMA Junkie*,⁵⁵ TBS's *Bleacher Report*,⁵⁶ and ESPN's *MMA Power Rankings*⁵⁷—an indication of the omitted weight classes' relative lack of importance in the industry. Finally, my Ranked measure of the Relevant Input Market conservatively includes even these four minor weight classes.⁵⁸

23. Dr. Topel claims that the Headliner Submarket definition "implies that top athletes are interchangeable across weight classes."⁵⁹ That is incorrect: What matters for market definition is not whether all Fighters are perfectly fungible with all other Fighters, but whether a hypothetical monopsonist over a group of Fighters could depress their compensation below competitive levels.⁶⁰ It is no doubt true that Fighters from different weight classes are often not perfectly interchangeable (although Fighters do sometimes transition between neighboring weight classes).⁶¹

54. *Id.*

55. See <http://mmajunkie.com/rankings> (reporting rankings for the following ten MMA weight classes: Men's Heavyweight, Men's Light Heavyweight, Men's Middleweight, Men's Welterweight, Men's Lightweight, Men's Featherweight, Men's Bantamweight, Men's Flyweight, Women's Bantamweight, and Women's Strawweight).

56. See <http://bleacherreport.com/articles/2661894-bleacher-report-mma-rankings-for-september-2016-ahead-of-ufc-203> (reporting rankings for the following ten MMA weight classes: Women's Strawweight, Men's Flyweight, Men's Bantamweight, Women's Bantamweight, Men's Featherweight, Men's Lightweight, Men's Welterweight, Men's Middleweight, Men's Light Heavyweight, and Men's Heavyweight).

57. See <http://www.espn.com/mma/rankings> (reporting rankings for the following eight MMA weight classes: Men's Heavyweight, Men's Light Heavyweight, Men's Middleweight, Men's Welterweight, Men's Lightweight, Men's Featherweight, Men's Bantamweight, and Men's Flyweight).

58. Singer Report ¶99, n. 268.

59. Topel Report ¶216.

60. Singer Report ¶¶97-98.

61. See, e.g., <http://www.fightmatrix.com/faq/> ("The rating system is division-adjusted, not division-specific. In other words, fighters carry their previous achievements with them to their new divisions..."). Conor McGregor

Indeed, no two Fighters are identical. But that does not imply that a hypothetical monopsonist over Headliners could not exercise monopsony power. To the contrary, it implies that the Headliner Submarket definition is conservative, and that Zuffa could profitably exercise monopsony power by controlling a smaller set of top Fighters than it actually controls. Dr. Topel also claims that the Headliner Submarket is “an inaccurate representation of top athletes,”⁶² because Headliners often appear in bouts below the Top of the Card during the Class Period.⁶³ Again, even if it were correct, it would imply only that the Headliner Submarket definition is conservative, because the presence of Headliners below the Top of the Card indicates that a hypothetical monopsonist over only a subset of Headliners could profitably exercise monopsony power. Dr. Topel also claims that the Headliner Submarket definition is inaccurate because “among Zuffa athlete-events that were main event bouts in 2010-2016, 22 percent were not included in Dr. Singer’s ‘Headliners.’”⁶⁴ In other words, Dr. Topel has helpfully (to my analysis) shown that the Top of the Card was comprised of Headliners in nearly 80 percent of Zuffa events between 2010-2016. Moreover, at least one Headliner was at the Top of the Card in 91 percent of Zuffa events from 2010 to 2016. Dr. Topel fails to explain why a hypothetical monopsonist in control of the inputs necessary to stage 91 percent of Zuffa’s events during the Class Period could not exercise monopsony power. If anything, these statistics confirm my own conclusions regarding the Relevant Input Submarket.

24. My Ranked measure of the Relevant Input Market includes all Fighters encompassed by the Tracked measure plus any Fighter ranked higher than (or equal to) 650 in any

alone has fought in three different weight classes. McGregor fought in the Featherweight class in UFC 194, as a Welterweight in UFC 202, and as a Lightweight in UFC 205. See <http://www.ufc.com/event/UFC194>; <http://www.ufc.com/event/UFC-202>; <http://www.ufc.com/event/ufc-205>.

62. Topel Report ¶217.

63. *Id.*

64. *Id.*

of the fourteen MMA weight classes in the FightMatrix database, as well as the MMA Promotion ONE Championship.⁶⁵ The Ranked measure encompasses Fighters from hundreds of MMA promoters,⁶⁶ the vast majority (if not all) of which are what Zuffa has referred to as the “minor leagues” (in that they are literally and figuratively out of Zuffa’s league).⁶⁷ The Ranked measure of the Relevant Input Market is therefore extremely conservative. Dr. Topel offers no critiques specific to the Ranked measure of the Relevant Input Market,⁶⁸ nor do any of Zuffa’s economists.

25. My initial report explains that athletes from combat-oriented sports outside of MMA such as boxing and wrestling are outside the Relevant Input Market, as are athletes from non-combat sports such as football or hockey.⁶⁹ Dr. Topel not only makes no attempt to dispute this conclusion,⁷⁰ but he also essentially concedes its accuracy. For instance, during his deposition,

65. Singer Report ¶99.

66. *Id.* ¶111.

67. *Id.* ¶¶104-107 (explaining that even the most prominent MMA promoters were at best distant substitutes to Zuffa from the perspective of Fighters); *id.* ¶¶134-140 (explaining that market observers and participants viewed Zuffa as dominant; Zuffa’s current owners view the UFC as a sports league unto itself as NFL; Dana White declares “we’re the [expletive] NFL. Period. End of story.”). Dr. Topel admitted in his deposition that he’s aware of evidence that Zuffa considered certain MMA promotions to be “minor leagues.” *See* Topel Dep. at 376:25-377:7. Dr. Topel also compared “minor league” promotions to triple-A leagues in MLB “where athletes play either because they like playing or because they hope to make it to the major leagues.” *Id.* at 377:8-19. Dr. Topel also admitted that none of the competitors that Zuffa acquired (WFA, WEC, Pride, Strikeforce) had been able to challenge Zuffa’s market share in either the input or output markets. *Id.* at 370:25-371:13. Dr. Topel also admitted that at the time they were purchased, none of the promotions that Zuffa acquired presented a significant economic threat to the UFC. *Id.* at 372:22-373:13. Similarly, Dr. Topel claims in his report that none of the MMA promotions that Zuffa has acquired, including relatively prominent promotions such as Pride and Strikeforce, had any substantial market power or share. Topel Report ¶172. By implication, if even the relatively prominent promotions that Zuffa thought enough of to acquire never seriously challenged Zuffa for share or power, it is unlikely that other MMA promotions were capable of doing so.

68. Dr. Topel does critique all three of my Relevant Input Market metrics for failing to account “for the competitive pressure created by the possibility of entry.” Topel Report ¶207. As explained in Part I.A.3 below, this critique is without merit.

69. Singer Report Part II.A.1.

70. Dr. Topel does include a single sentence stating that “there is a large potential supply of MMA athletes that a new promoter could employ...MMA athletes have come from, among other places, collegiate or Olympic wrestling or boxing programs, martial art academies, the military, and other professional sports.” Topel Report ¶65. This claim, even if true, would not demonstrate that a hypothetical monopsonist would have to control everything from Olympic wrestling to boxing to professional sports in order to exercise monopsony power, and Dr. Topel does not claim that it does. Instead, the claim is made with reference to entry barriers for potential MMA promoters. As explained in Part I.A.3 below, Dr. Topel fails to provide any meaningful support, beyond vague speculation, for his claim that entry

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Dr. Topel admitted that it would not be easy for MMA fighters to switch to boxing.⁷¹ None of Zuffa's other economists disputes my opinion in this regard.⁷²

26. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

barriers are low; to the contrary, he concedes that entry barriers are substantial, and that the challenged contracts themselves form such barriers.

71. Topel Dep. at 484:12-15. Dr. Topel was also unable to identify any MMA fighter other than Conor McGregor who became a successful professional boxer for more than one fight. *Id.* at 485:4-10. He also admitted that he has done no analysis of the costs or feasibility of a fighter switching from MMA to another sport. *Id.* at 486:1-12.

72. [REDACTED]

[REDACTED]

73. Topel Report ¶96.

74. Topel Dep. at 363:13-364:3.

75. *Id.* at 370:25-371:13.

76. *Id.* at 372:22-373:13.

77. *Id.* at 393:3-11.

78. *Id.* at 397:12-18.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

2. Relevant Output Market

27. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

28. With respect to the Relevant Geographic Market, during his deposition, Dr. Topel acknowledged that the market for Live MMA Events broadcast in Asia is separate from the market for Live MMA Events broadcast in the United States.⁸²

3. Barriers to Entry

29. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

79. Singer Report Part III.A.2.

80. *Id.* Part III.A.5.

81. Topel Report ¶96.

82. Topel Dep. at 494:16-24.

83. Singer Report ¶133.

84. *Id.* ¶133, ¶¶156-166, Parts III.C-III.D.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

30. Dr. Topel also opined that, by attracting and then locking-up in exclusive contracts “a significant share of the top athletes,”⁸⁷ an MMA promoter could perpetuate its market dominance. As he opines, “there is a *natural tendency* for a leading promoter to attract a significant share of the top athletes. This follows from the complementarity of athlete talents in producing high-quality bouts, and the desire among athletes to fight against the best[.]”⁸⁸ As a consequence of this market tipping, Dr. Topel acknowledges that “Zuffa is larger than its rivals, has a larger share of top athletes, and is more successful at attracting audience share and revenue.”⁸⁹

85. [REDACTED]

86. [REDACTED]

87. Topel Report ¶96.

88. [REDACTED]

89. [REDACTED]

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

31. Despite effectively conceding substantial and significant barriers to entry—including that the exclusive Fighter contracts themselves form such barriers—Dr. Topel nonetheless claims that my definitions of the Relevant Input Market and Submarket fail to account for “the competitive pressure created by the possibility of entry,”⁹⁰ given that, in his view, “barriers to entry are low.”⁹¹ As “proof” of low entry barriers, Dr. Topel claims, without any supporting analysis, that there “is a large potential supply of athletes that a new promoter could employ,”⁹² from “collegiate or Olympic wrestling or boxing programs, martial art academies, the military, and other professional sports.”⁹³ My initial report explained that the generalized fighting skills required for MMA competition are not seamlessly transferable with the more specialized skills required in (say) boxing, and that skills are even less transferrable between MMA and non-combat sports.⁹⁴ As explained above, Dr. Topel not only makes no attempt to dispute this conclusion; he essentially concedes its accuracy. In addition to admitting that it would not be easy for athletes to switch between MMA and boxing,⁹⁵ Dr. Topel admitted in his deposition that he has done no analysis of the costs or feasibility of a fighter switching between MMA and other sports.⁹⁶

32. Dr. Topel provides no evidence that a potential MMA promoter entrant could compete effectively with Zuffa, much less provide the “rapid supply responses with direct

90. Topel Report ¶207.

91. *Id.*

92. *Id.* ¶207, n. 308; *id.* ¶65.

93. *Id.*

94. Singer Report ¶¶101-103

95. Topel Dep. at 484:12-15.

96. *Id.* at 486:1-12. Dr. Topel was also unable to identify any MMA fighter other than possibly Conor McGregor who became a successful professional boxer for more than one fight. *Id.* at 485:4-10.

competitive impact in the event of a SSNIP”⁹⁷ that define rapid entry under standard antitrust principles. As a claimed example of “the speed with which new MMA promoters can get established in the marketplace,”⁹⁸ Dr. Topel states that a Russian MMA promoter (Absolute Championship Berkut) is “on track to promote 27 events in 2017” after promoting its first event in 2012.⁹⁹ But Berkut has promoted only a single, untelevised event in the United States, a second untelevised event in North America (Canada), and has no upcoming events scheduled in North America.¹⁰⁰ Thus, the vast majority of Berkut’s events (98 percent) have been outside the Relevant Geographic Market.¹⁰¹ Moreover, none of Berkut’s events has been available via PPV in North America or broadcast on television in North America. Berkut has virtually no presence in the Relevant Geographic Market, and is hardly “established in the marketplace,” let alone a threat to Zuffa.

33. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

97. Merger Guidelines §5.1.

98. Topel Report ¶72.

99. *Id.*

100. See <http://www.sherdog.com/organizations/Absolute-Championship-Berkut-8185> (accessed 12/6/2017). See also <https://www.tapology.com/fightcenter/events/43182-absolute-championship-berkut-51>, which shows that Absolute Championship Berkut’s only event in the United States was broadcast via “Internet Stream,” and <https://www.tapology.com/fightcenter/events/47826-acb-72-makovsky-vs-sherbatov>, which shows its second North American event in Canada was broadcast via “FITE App,” a smartphone application.

101. See <http://www.sherdog.com/organizations/Absolute-Championship-Berkut-8185>. (Accessed 12/6/2017).

102. Professional Fighters League “purchased the fighting operations and event infrastructure of the World Series of Fighting (WSOF) earlier this year [2017].” See *Professional Fighters League Announces World’s Only Mixed Martial Arts League*, PR NEWswire, Apr. 19, 2017, available at: <https://www.prnewswire.com/news-releases/professional-fighters-league-announces-worlds-only-mixed-martial-arts-league-300441555.html>.

103. Topel Report ¶24.

104. Singer Report ¶131, Table 3.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

B. Zuffa's Economists in No Way Undermine My Direct Proof of Zuffa's Market Power

34. In addition to indirect evidence of Zuffa's market power, my initial report reviews direct evidence of Zuffa's monopoly and monopsony power.¹¹¹ Direct proof simply requires evidence that Zuffa has in fact exercised monopoly or monopsony power or both. Product market definition is a tool to *infer* pricing power—that is, the ability to raise prices above competitive levels, or to suppress compensation below competitive levels. Because here we have direct evidence that Zuffa exercised monopoly and monopsony power, indirect evidence is of secondary importance.¹¹²

35. The direct evidence reviewed in my initial report includes direct evidence of Zuffa's ability to (1) suppress Fighter compensation below competitive levels; (2) profitably raise

105. Topel Report ¶96.

106. Singer Report ¶¶134-138.

107. [REDACTED]

108. Topel Report ¶24.

109. Singer Report ¶124.

110. Topel Dep. at 494:22-24 ("Q. The 90 percent figure is of the Asian MMA market; is that right? A. Yes.").

111. Singer Report Part III.B

112. *Id.* ¶93.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

prices for Live MMA Events; (3) restrict demand for Fighter services; (4) restrict supply of Live MMA Events; and, (5) exclude and impair potential rival MMA promoters.¹¹³ This evidence allows me to conclude that Zuffa possesses and has exercised significant monopoly and monopsony power.¹¹⁴ As explained below, Zuffa's economists in no way undermine these conclusions.

1. Power to Suppress Fighter Compensation

36. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

113. *Id.*

114. *Id.*

115. These fixed effects control for all of a Fighter's individual-specific attributes that remain constant over time.

116. Singer Report Part III.D.1.

117. *Id.*

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

37. Additional direct evidence that the Challenged Conduct suppressed Fighter compensation below competitive levels includes evidence that: (1) Zuffa has reduced the share of Event Revenue paid to Fighters over time (as the degree of foreclosure rose); (2) Zuffa pays Fighters a significantly lower share of its Event Revenue than did Strikeforce (before Zuffa acquired it) or Bellator; and (3) Zuffa unilaterally restricted compensation of its Fighters by profitably imposing a new sponsorship tax.¹¹⁹ As explained below, Zuffa's economists' critiques of this evidence are without merit.

38. [REDACTED]

[REDACTED]

[REDACTED]

118. Singer Report ¶212 ("This generalized suppression of compensation as the number and vitality of bidders for workers' services is reduced is just what is predicted by elementary economics, which shows that a monopsonist suppresses compensation to all of its labor inputs, just as a monopolist raises prices to all of its customers. Monopsony power is the mirror image of monopoly power; the harm to competition from monopsony is directly analogous to the harm from monopoly. A monopolist harms buyers by charging them a price above the competitive level; a monopsonist harms sellers by paying them a price below the competitive level"). See also DENNIS CARLTON & JEFFREY PERLOFF, MODERN INDUSTRIAL ORGANIZATION (Pearson 2005 4th ed.) [hereafter "Modern IO"] at 107-110; see also Merger Guidelines §1 ("Enhancement of market power by buyers, sometimes called 'monopsony power,' has adverse effects comparable to enhancement of market power by sellers. The Agencies employ an analogous framework to analyze mergers between rival purchasers that may enhance their market power as buyers"); *id.* §12; *Johnson v. Ariz. Hosp. & Healthcare Ass'n (AzHHA)*, No. CV 07-1292-PHXSRB, 2009 WL 5031334 (D. Ariz. July 14, 2009); *Vogel v. Am. Soc'y of Appraisers*, 744 F.2d 598, 601 (7th Cir. 1984) (stating that monopoly and monopsony are "symmetrical distortions of competition") (quoted in *Weyerhaeuser Co. v. Ross-Simmons Hardwood Lumber Co.*, 549 U.S. 312, 322 (2007)).

119. Singer Report Part III.D.2.

120. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

39. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

121. Topel Report ¶¶169-171.

122. MICHAEL KATZ & HARVEY ROSEN, MICROECONOMICS at 312-315 (Irwin McGraw-Hill 3rd ed. 1998) [hereafter “KATZ & ROSEN”]. *See also* RODNEY D. FORT, SPORTS ECONOMICS 206 (Prentice Hall 3rd ed. 2011) [hereafter, “Fort Sports Econ”] (“In a competitive talent market, we expect that players get paid pretty close to their MRP.”); ROBERT S. SMITH, 61 MODERN LABOR ECONOMICS: THEORY AND PUBLIC POLICY (9th ed. 2006) (“For example, if the presence of a tennis star increases attendance at a tournament by 20,000 spectators, and the organizers net \$25 from each additional fan, the marginal income produced by this star is equal to her marginal product (20,000 fans) times the marginal revenue of \$25 per fan. Thus, here marginal revenue product equals \$500,000.”).

123. *See, e.g.*, ROGER BLAIR, SPORTS ECONOMICS 354 (Cambridge University Press 2012) [hereafter, “Blair Sports Econ”] (explaining that, when professional athletes are paid less than their MRP, “[t]his is *exploitation* in the sense that the player is paid less than his value to the club”) (emphasis in original).

124. Dr. Topel conceded that even a monopsonist pays its workers in relation to, albeit lower than, their MRP. *See* Topel Dep. at 21:11-15 (admitting that “over some period of time, all things equal, when a firm’s marginal revenue product of its workers rises, a firm with monopsony power will pay its workers more”); *id.* at 21:4-15 (admitting that, all things equal, increase in MRP leads a monopsonist to increase compensation); *id.* at 22:18-23 (admitting that, all things equal, decrease in MRP leads a monopsonist to decrease compensation).

125. Topel Report ¶169.

126. *See* Topel Dep. at 58:15-20 (admitting that “[y]ou would need to know more” than the mere fact that compensation was rising to determine whether monopsony power was or was not being exercised).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

40. Relatedly, Dr. Topel claims falsely that my initial report did not [REDACTED]

[REDACTED]¹²⁸ In fact, my initial report demonstrated that increases in Fighter compensation over time have been swamped by increases in Zuffa’s Event Revenue per Fighter, indicating that Fighter compensation has failed to keep pace with increases in Fighter productivity—a clear indication of the exercise of monopsony power.¹²⁹ More generally, my impact regressions control for Zuffa’s increasing revenues by measuring Fighter compensation as a percentage of Event Revenue, and also control for a range of additional factors affecting Fighter pay. The results of those analyses demonstrate that, holding other factors constant, an increase in Zuffa’s foreclosure of the Relevant Input Market and/or Submarket leads to an economically and statistically significant decrease in the share of Event Revenue paid to Fighters, indicating that the Challenged Conduct permitted Zuffa to suppress Fighter compensation substantially relative to the but-for world.¹³⁰

127. *See id.* at 17:18-22 (admitting that “labor in a competitive market receives compensation equal to its marginal revenue product in competing uses”).

128. Topel Report ¶169.

129. Singer Report ¶¶271-272.

130. *Id.* Part III.D.1.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

136.

PUBLIC COPY - REDACTED

[REDACTED]

138. *Id.* ¶191.

139. [REDACTED]

140. ZFL-0876778 (Auddie Attar (fighter manager) to Silva:

[REDACTED] See also ZFL-2535978 (Manos Terzitane (fighter

manager) to Mersch:

[REDACTED]

ZFL-2699687 (Text messages between Dana White and MMA Fighter Myles Jury, who states:

141. ZUF-00337760.

142. [REDACTED]

143. [REDACTED]

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

2. Restricted Supply of Fighter Services

42. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

144. Teddy Montemayor & John Bieschke, *How the UFC and Reebok Changed the Sponsorship Landscape in MMA*, MMA NEWSLINE, Jan. 9, 2017 (emphasis added) (cited at Topel Report ¶243, n. 348).

145. *Id.*

146. Mike Chiappetta, *The Grass Is Greener: UFC-to-Bellator Signees Speak Out*, BLEACHER REPORT, Apr. 5, 2016, available at <http://bleacherreport.com/articles/2630256-the-grass-is-greener-ufc-to-bellator-signees-speak-out> (cited at Topel Report ¶243, n. 348).

147. *Id.*

148. Singer Report Part III.D.3.

149. Modern IO at 107-110.

150. See, e.g., Steven Salop, *The Flawed Incremental Price-Cost Test*, 81 ANTITRUST L.J. (2017) [hereafter, “Salop (2017)”]

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

43. My initial report also reviewed evidence that Zuffa pursued a deliberate strategy of restricting the number of career paths available to Fighters.¹⁵⁷ None of Zuffa's economists addresses this evidence.

151. Topel Report ¶244.

152. *Id.*, n. 351 (citing to Silva Dep. at 120:16-121:20).

153. [REDACTED]

154. [REDACTED]

155. Topel Report ¶244 (citing Shelby Dep. at 120; Hendrick Dep. at 181-82).

156. [REDACTED]

157. Singer Report ¶196 (citing Jesse Baker & Matthew Thomson, *The Ultimate Fighting Championships (UFC): The Evolution of a Sport*, in CASES IN MARKETING MANAGEMENT 114 (SAGE Publications, Kenneth E. Clow & Donald Baack, eds., 2011)).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

44.

[illegible]

45.

161. *Id.* ¶25

166. *Id.*

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

46. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

167. Singer Report ¶201.

168. Katz & Rosen at 78-79.

169. Topel Report ¶249.

170. See, e.g., Gregory S. Crawford, *Cable Regulation in the Internet Era*, Chapter 3 in NANCY L. ROSE, ED., *ECONOMIC REGULATION AND ITS REFORM: WHAT HAVE WE LEARNED?* 174-75 (University of Chicago Press 2014) (“Are (most) cable markets competitive? The evidence for wireline competition is encouraging, but its narrow scope (pre-telco entry) has limited measured benefits to a small fraction of cable households and lack of data (post-telco entry) renders conclusions impossible. While there is some evidence of a positive impact of satellite competition on cable prices, the estimated cable price elasticities suggest *cable systems still exert considerable market power*. Despite this, more large-scale entry appears unlikely. Further wireline entry means paying substantial fixed costs and facing entrenched competitors.”) (emphasis added).

171. Topel Report ¶249, n. 362.

172. *Id.*

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

47. My initial report also demonstrated that the output of Live MMA Events generally has fallen since 2010, both in absolute terms and relative to prior trends, because the output of Live MMA Events by non-Zuffa promoters has fallen off sharply, and Zuffa's supply of Live MMA Events did not increase by enough to make up for the difference.¹⁷⁸ Dr. Topel opines that "there is no reason why a more mature market that existed after 2010 would grow at the same high rate as when the market was just starting out."¹⁷⁹ But Dr. Topel ignores that the total supply of Live MMA Events decreased in absolute terms, and not just relative to the pre-2011 trend.¹⁸⁰ Dr. Topel does not attempt to explain or offer any procompetitive reason why the supply of Live MMA

173. *Id.* ¶32.

174. *Id.* ¶250.

175. [REDACTED]

176. Katz & Rosen at 64-70.

177. Topel Report ¶32.

178. Singer Report ¶¶203-206.

179. Topel Report ¶253.

180. Singer Report Figures 4A-4C.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Events would *shrink* in a “mature” MMA market. To the contrary, it is apparently his expectation that output was indeed expanding, in claiming (incorrectly) that “Zuffa’s market-expanding strategy and investments have... increased the number and variety of MMA events available to consumers, and viewership... during the class period.”¹⁸¹ Further, the notion that the MMA Promotion market is “mature” (and thus that we should expect slowing growth) is unsupported given its relative novelty as a major league sport, especially when compared with other established professional sports like baseball, basketball, hockey, football, soccer, and boxing, which have existed for many decades (or, in the case of baseball, well over a century). It is therefore reasonable to expect that, absent the Challenged Conduct, total output of MMA Live Events would have continued to grow.¹⁸²

48. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

181. Topel Report ¶23.

182. [REDACTED]

183. Topel Report ¶¶257-258, Exhibits 30-31.

184. *Id.* Exhibit 30.

185. *Id.* Exhibit 31.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

49. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

4. Power to Exclude Rivals

50. My initial report explains that Zuffa guaranteed that would-be rivals could not pose a significant competitive threat by denying them access to a broad stable of high-quality MMA Fighters, a critical input to staging successful Live MMA Events.¹⁸⁸ Some rivals were acquired by Zuffa, others went out of business, and others were relegated to feeder leagues.¹⁸⁹ Both Zuffa and third parties recognize that the Challenged Conduct has been so successful in excluding rivals that

186. *Id.* Exhibit 31.

187. *See, e.g.*, WME-ZUFFA-0001150, at 10 (showing consistently higher event ticket pricing for PPV events, compared with non-PPV events).

188. Singer Report Part III.C.1

189. *Id.* Parts II.A.1, III.A.1, III.A.8.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

throughout the Class Period Zuffa has had no close competitors in the Relevant Output Market.¹⁹⁰ The revenues and market shares of other MMA promoters have been throughout the Class Period trivial in comparison to those of Zuffa.¹⁹¹

51. As explained in Parts I.A.2-3 above, neither Dr. Topel nor any of Zuffa's economists disputes my conclusion that Zuffa's supposed MMA rivals have failed to capture a significant share of the Relevant Output Market, or that Zuffa's share in the Relevant Output Market is significant; to the contrary, Zuffa's economists have emphasized that potential MMA rivals have failed consistently to achieve viability or profitability.¹⁹²

52. Dr. Topel claims that Zuffa does not have the power to exclude rivals because "barriers for MMA promoters to enter the market are low,"¹⁹³ and because Zuffa "has faced and continues to face vigorous competition in the marketplace."¹⁹⁴ As explained in Part I.A.3 above, Dr. Topel's claims regarding barriers to entry are without merit, and are contradicted by Dr. Topel himself at deposition. Indeed, Dr. Topel repeatedly conceded that Zuffa imposed substantial (artificial) entry barriers, including in particular those barriers imposed by the Challenged Conduct itself. Moreover, Dr. Topel's supposed evidence of "vigorous competition" consists of the same MMA promoters that have failed to achieve significant market share or to achieve consistent profitability, as well as MMA promoters outside of the Relevant Geographic Market.

190. *Id.* Parts III.A.1, III.A.4-5, III.A.8.

191. *Id.* Parts III.A.4-5.

192. Dr. Topel admitted in his deposition that none of the competitors acquired by Zuffa achieved a significant market share and asserted that Zuffa's market share has been stable over time. *See* Topel Dep. 368:13-17 ("Q. So all of the acquisitions together, in your understanding, did not appreciably change Zuffa's market share in either the input or output market; is that what you're saying? A. Yes."). *See also id.* at 370:25-371:13 ("Q. Is it fair to say that none of the competitors that Zuffa purchased that you identified in paragraph 173, in your view, had been able to challenge Zuffa's dominance in either the input or output markets? ... A. Well, I don't know what it means to challenge dominance. I've seen dominance used in the context that noneconomists would use it. Zuffa has a level of market share in a position in the market. ... It's been pretty stable over time.").

193. Topel Report ¶259.

194. *Id.*

C. Zuffa's Economists Do Nothing to Undermine My Conclusion That the Challenged Conduct Substantially Foreclosed Competition

53.

[REDACTED]

1. Dr. Topel's Critiques of My Foreclosure Calculations Are Without Merit

54.

[REDACTED]

195. Singer Report Part III.C.

196. *Id.* Part III.C.2.

197. *Id.* Part III.C.4.

198. *Id.* Part III.C.3.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

55. [REDACTED]

[REDACTED]

199. *Id.* III.C.1.

200. [REDACTED]

201. Topel Report ¶118.

202. Singer Report Part III.C.2.

203. *Id.* Part III.D.1.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

56. The foreclosure metrics developed in my initial report are designed to measure the share and relative importance to an MMA promotion of the Fighters in the Relevant Input Market (and Submarket) that Zuffa had locked up in long-term exclusive contracts.²⁰⁹ As a part of this process, I measure the pool of Fighters who were active around the time of a particular Live MMA Event; the pool of active Fighters is defined as Fighters who participated in a Live MMA Event within nine months before or after the Live MMA Event in question.²¹⁰ This method therefore

204. *Id.* Part III.C.1.

205. ZUF-00162329, at 371 (October 2009 Deutsche Bank CIM).

206. Topel Report ¶96 (emphasis added).

207. *Id.*

208. Topel Dep. at 437:11-22 (discussing ZUF-00162329 – October 2009 Deutsche Bank CIM).

209. Singer Report Part III.C.2.

210. *Id.* ¶308. As always, only Live MMA Events within the Relevant Output Market are used.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

counts all Fighters who were active within an 18-month window.²¹¹ Dr. Topel claims that my foreclosure calculation “miscounts athletes”²¹² because: (1) Zuffa athletes would be counted more than once if they fought more than once during the 18-month window;²¹³ (2) non-Zuffa athletes who did not fight during the 18-month window would not be counted;²¹⁴ and (3) athletes who left Zuffa or were cut by Zuffa during the 18-month window would still be counted provided they fought for Zuffa during the window.²¹⁵ Dr. Topel is wrong on all three points.

57. With respect to (1), although it is true that Zuffa athletes would be counted twice if they fought twice within the window, the same is true of non-Zuffa athletes, and thus there is no bias one way or the other. In each case, it is logical and reasonable to count these Fighters each time that they appear in a bout, for the same reason that it makes sense to give an employee who works 40 hours a week twice as much weight as one that works 20 hours per week when calculating the number of full-time equivalent employees at an organization.²¹⁶ With respect to (2), although it is true that non-Zuffa athletes who did not fight during the 18-month window would not be counted, the same is true of Zuffa athletes. In each case, the Fighter is symmetrically deemed inactive, with Zuffa and non-Zuffa athletes treated the same, and thus here too there is no bias. The same is true with respect to (3): Fighters who left or were cut from any (Zuffa or non-Zuffa) MMA promoter during the 18-month window would still be counted, provided that the Fighter fought at least once during the window and was included in the Relevant Input Market.

211. *Id.* Part III.C.

212. Topel Report ¶232.

213. *Id.* (“This implies that, for example, a Zuffa athlete may be counted more than once if he or she fought more than once in the 18-month window.”).

214. *Id.* (“a Bellator athlete would not be counted at all if he or she did not fight in the 18-month window”).

215. *Id.* (“Further, an athlete who left Zuffa to fight for Bellator before the month in question, or athletes who retired or were cut by Zuffa before the month in question, will still be included in Zuffa’s share provided they had a bout with Zuffa during the 18-month window.”).

216. *See, e.g.*, <http://www.businessdictionary.com/definition/full-time-equivalent-FTE.html>.

Thus, none of this purported “miscounting” creates any bias (or asymmetric treatment of Zuffa and non-Zuffa Fighters) in my analysis, and Dr. Topel makes no attempt to demonstrate that it does.

217. Topel Report ¶233.

219. Singer Report ¶¶68-73.

221 [REDACTED]

222. Singer Report Part III.C.2.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

59. Dr. Topel claims to address these “deficiencies” by calculating foreclosure based on unweighted Fighter counts, stratified by Fighter rank. Given that the point of assessing the degree of foreclosure here is to determine the share of a critical input (namely, Fighters) Zuffa has locked-up in exclusive arrangements, it would not make sense to ignore the relative differences between Fighters and/or the promotions for which they fight. It is for this reason that I use two different weighting methods.²²³ Dr. Topel, however, calculates Zuffa’s unweighted share of Fighters ranked 1 through 15, and similarly for Fighters ranked 16 through 30, those ranked 31 through 50, those ranked 51 through 100, and those ranked 101 or worse.²²⁴ Using unweighted Fighter counts is inappropriate because it ignores that Fighters vary in their ability to attract viewers, and hence their value to an MMA promoter.²²⁵ For example, Dr. Topel would calculate the same foreclosure share

223. *Id.* ¶128, ¶¶169-170.

224. Topel Report ¶¶234-235, Exhibits 28-29.

225. Singer Report ¶128.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

whether Zuffa had foreclosed the top five Fighters in each weight class, or only the Fighters ranked 11 through 15 in each weight class.²²⁶ Dr. Topel's foreclosure analysis is therefore erroneous.

60. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

61. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

226. In his deposition, Dr. Topel admitted that, on average, "higher ranked fighters, all things equal, generate more revenues when they fight than lower-ranked fighters." Topel Dep. at 432:18-24. He also admitted that audiences are "drawn to fights among highly-ranked opponents." *Id.* at 431:2-7 ("Q. And are audiences drawn to fights among highly-ranked opponents? A. I think – I think ratings are higher. I think there was some evidence that ratings are higher when highly-ranked people fight against each other."). He admitted further that, on average, "consumers will be willing to pay more to see highly-ranked opponents fight than lower-ranked opponents fight." *Id.* at 432:10-17 ("Q. All things equal, consumers will be willing to pay more to see highly-ranked opponents fight than lower-ranked opponents fight; is that fair? A. In every instance, no, but on average, probably yes.").

227. [REDACTED]

[REDACTED]

228. Topel Report ¶104.

229. *Id.*

230. *Id.* ¶105.

231. [REDACTED]

232. See Gary Herman, "UFC is no longer interested in Andrei Arlovski," *Five Ounces of Pain* (July 30, 2009) [hereafter, "Herman"], available at: <http://www.fiveouncesofpain.com/2009/07/30/ufc-is-no-longer-interested-in-andrei-arlovski/>; Mike Fagan, "The Week in Quotes: December 27th – January 2nd," *Bloody Elbow* (Jan. 3, 2009), available at: <https://www.bloodyelbow.com/2009/1/3/708095/the-week-in-quotes-decembe>.

233. See Herman, *supra*. See also Steven Marrocco, "Andrei Arlovski released from WSOF, signs with UFC for targeted bout with Schaub" *MMA Junkie* (April 24, 2014), available at: <http://mmajunkie.com/2014/04/andrei-arlovski-released-from-wsof-signs-with-ufc-for-targeted-bout-with-brendan-schaub>.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

62. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

234. Topel Dep. at 404:19-22. *Id.* at 407:5-8, 409:5-7 [REDACTED].

235. *Id.* at 114:17-24; *see also id.* at 355:8-16 (admitting the right-to-match clause could undermine the incentive of Bellator to formulate a competing bid).

236. *Id.* at 124:1-13.

237. *Id.* at 109:25-110:13.

238. Topel Report ¶198.

239. Singer Report ¶68.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

63.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

240.

[REDACTED]

241.

[REDACTED]

242.

[REDACTED]

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

2. Dr. Topel Does Not Undermine My Conclusion that the Duration and Staggering of Zuffa's Contracts with Fighters Prevented Meaningful Competition by Other MMA Promoters

64. My initial report explained that Fighter careers typically last only a few years, which means that even a single Zuffa contract could easily span all or the vast majority of a Fighter's career (even if one ignores Zuffa's ability to leverage the Challenged Conduct to renew and extend Fighter contracts).²⁴³ Dr. Topel claims that this is not the case because the median career length of a UFC Fighter is purportedly approximately 8.9 years.²⁴⁴ Dr. Topel's statistic is misleading because it encompasses all Fighters who ever had a UFC bout, and encompasses all bouts in which these Fighters ever participated, regardless of promoter, and regardless of the Fighter's rank at the time of each bout in his or her career. As seen in Table 1 below, the median career duration for a Zuffa Fighter *at Zuffa*—typically the apex of a Fighter's career—is 0.82 years; the average is 2.00 years. I also performed similar calculations for Fighters in the Relevant Input Market and Submarket. As seen below, the median duration of Fighter careers ranges from 0.38 years to 1.33 years; the average duration ranges from 1.80 years to 2.55 years. Accordingly, Dr. Topel's 8.9-year statistic is driven by Fighters when they are *outside* the Relevant Input Market and Submarket—in other words, it is capturing the portion of a Fighter's career spent in the minor leagues. (This is analogous to including a professional athlete's time playing in high school and college when calculating the length of her career). Finally, even if Dr. Topel's 8.9-year statistic were relevant, the median contract duration during the Class Period (approximately 35 months or 2.9 years) would still encompass about one third of the median Fighter's career (equal to 2.9/8.9), even before contract extensions and renewals are taken into account.

243. Singer Report ¶¶89-91.

244. Topel Report ¶116.

TABLE 1: FIGHTER CAREER DURATIONS (YEARS)

Fighter Population	Median	Mean
Zuffa Fighters in Zuffa Bouts	0.82	2.00
Relevant Input Market (Tracked Measure)	0.38	1.80
Relevant Input Market (Ranked Measure)	1.33	2.55
Headliner Submarket	1.00	2.26

Note: Consistent with Dr. Topel's analysis, Fighters with only one career bout are excluded.

65. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED].

245. Singer Report ¶174.

246. *Id.* ¶69.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

66. My initial report explained that Zuffa staggered its Fighter contracts such that, to the extent any would ever expire without renewal or retirement, there would never be a critical mass of Fighters available to a potential rival at any one time.²⁴⁷ Dr. Topel claims that the staggering of Zuffa's contracts means that [REDACTED]

[REDACTED]²⁴⁸ But in his report and his deposition, Dr. Topel himself concedes that top Fighters and aspiring top Fighters face strong incentives to join the organization that already has the vast majority of top Fighters, which in this case is Zuffa due in large part to the Challenged Conduct.²⁴⁹ Therefore, putting Fighters on staggered contracts makes it unlikely that another MMA promotion could compete effectively with Zuffa, because no more than a small share of top Fighters (if that) would ever become free agents in any one year.²⁵⁰ Thus, by Dr. Topel's own logic, the staggering of contracts prevents rivals from acquiring the critical mass of Fighters necessary to compete effectively with Zuffa. My own separate analysis confirms that the dearth of available top-level Fighters indeed impaired other MMA promoters from competing

247. *Id.* Parts II.C.2-3; *see also id.* ¶175.

248. Topel Report ¶118.

249. *Id.* ¶96 ("there is a natural tendency for a leading promoter to attract a significant share of the top athletes. This follows from the complementarity of athlete talents in producing high-quality bouts, and the desire among athletes to fight against the best"). In his deposition, Dr. Topel admitted that there is a natural tendency for a leading promoter to attract a significant share of the top athletes because admits that "athletes – their talents are complimentary, that the good athletes want to be in the places where the – where the other good athletes are so they can fight them." Topel Dep. at 433:14-21. Dr. Topel admitted further that, broadly speaking, Fighters who are successful against higher ranked opponents have greater opportunities for career advancement and increased compensation. *Id.* at 434:16-435:2. Dr. Topel also admitted that Zuffa has [REDACTED]

Id. at 446:15-19.

250. [REDACTED]

effectively with Zuffa.²⁵¹ Zuffa's current owners and independent analysts have recognized this effect as well.²⁵²

3. Dr. Topel Does Not Undermine My Conclusion That Zuffa's Contracts Were Coercive

67.

[REDACTED]

II. ZUFFA'S ECONOMISTS IN NO WAY UNDERMINE MY CONCLUSION THAT THE CHALLENGED CONDUCT SUBSTANTIALLY HARMED COMPETITION

68.

[REDACTED]

251. Singer Report Parts III.C.1, III.D.1; *see also* Part I.A.3, *supra*.

252. *Id.* Part III.C.1; *see also* Part I.A.3, *supra*.

253. *Id.* ¶176, Part II.C.1, Part II.B.1.

254. *See* Topel Report ¶96.

255. Singer Report Part II.B.1, ¶176.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

A. Dr. Topel Concedes That the Challenged Contractual Provisions Restrict Fighter Mobility, and That Restricted Mobility Reduces Compensation and Facilitates Zuffa’s Exercise of Monopsony Power

69. My initial report reviews each of the challenged contractual provisions in Zuffa’s Fighter contracts, and explains how the Challenged Conduct served to initiate, renew, and extend Fighter contracts, making Zuffa’s exclusionary provisions effectively perpetual (or nearly so) for the vast majority of Fighters, especially in relation to Fighters’ relatively short careers.²⁵⁸ By restricting Fighter mobility—thereby denying other MMA promoters access to a critical input—the Challenged Conduct permitted Zuffa to suppress Fighter compensation.²⁵⁹

70. In his deposition, Dr. Topel admitted that the contractual provisions that Plaintiffs are challenging are “restrictions on athlete mobility.”²⁶⁰ He also admitted that eliminating the challenged contractual provisions would allow more Fighters to “move [to other promoters]

256. *Id.* ¶¶180-187.

257. *Id.* Parts III.D.2-5.

258. *Id.* Parts II.B-II.C.

259. *Id.* Parts III.C-III.D.

260. Topel Dep. at 75:15-19; *see also id.* at 80:7-16.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

because there's more [Fighters] subject to outside bidding,"²⁶¹ and that that if the challenged provisions were removed, "other MMA promoters could immediately retain Zuffa's athletes ... if they wanted to."²⁶² He also admitted that "one reason why non-Zuffa firms employ some of the challenged contractual provisions ... is to restrain the mobility of the fighters that work for them."²⁶³

71. Dr. Topel also admitted that restrictions on Fighter mobility reduce compensation and facilitate the exercise of monopsony power. He agreed that, by making mobility more costly to its workers, a firm can pay them less.²⁶⁴ He conceded further that that eliminating the challenged contractual provisions would create "a transfer of wealth from Zuffa to the athletes,"²⁶⁵ and that eliminating the challenged contractual provisions could enhance fighter mobility and lead to higher fighter compensation, at least in the short run.²⁶⁶ Dr. Topel additionally admitted that, "if there's

261. *Id.* at 78:20-79:1 ("Q. So, in your view, at least in the short run, eliminating the challenged contractual provisions will enhance the mobility of the fighters; is that fair? A. I don't know if you call it enhance the mobility. More of them will move because there's more subject to outside bidding.").

262. *Id.* at 77:14-20.

263. *Id.* at 346:16-347:4.

264. *Id.* at 73:21-74:2 ("Q. So if firm A raises the costs somehow of moving from firm A to firm B, firm A can pay the worker less than if he hadn't raised the cost of mobility, right? ... A. Can pay the worker less than firm B."). Dr. Topel also admitted that there is a "degree" of monopsony power from the mere fact that it is costly for a worker to move from job to job. *Id.* at 344:17-21 ("A. ... There's a degree of monopsony power. You didn't need the wall. I already said there's a degree of what some people would call monopsony power there by the fact that it is – it is costly to move from A to B."). Dr. Topel also admitted that higher mobility costs lead to higher monopsony power. *Id.* at 345:1-8 ("Q. So all things equal, the higher the mobility costs in your example, the higher the monopsony power of the firms, correct? ... A. Yeah. It depends on how we make the mobility costs and things like that. It depends on what we do with the mobility costs."). *See also id.* at 346:1-8 ("Q. So all things equal, the higher the mobility costs in the example the more monopsony power the firms in that example have, all things equal; is that right? ... A. It was important that you said twice 'in that example.' So I agree.").

265. *Id.* at 76:4-77:3. *See also id.* at 84:11-18 ("Q. It's a transfer of wealth, in your view, from Zuffa to the fighters because in this instance Zuffa would either have to pay the fighters more or someone else would pay the fighters more, right? ... A. I think I see where you're going with it and yes.").

266. *Id.* at 84:25-85:5 ("Q. So for the existing stock of Zuffa athletes eliminating the challenged contracts, at least in the short run, would enhance fighter mobility and lead to higher fighter compensation, correct? A. It could do that."). *See also id.* at 86:1-11 ("Q. Is it fair to say in the short run if we eliminate the challenged contractual provisions, one immediate effect is that fighters get paid closer to the amount of Event Revenue that they generate for the promotion; is that fair? ... A. They'll get paid more than they would have because they're getting some of the returns on the investment that were previously shared with – with the investing firm.").

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

free mobility I can switch to anybody who will pay ‘competitive compensation.’”²⁶⁷ He also admitted that elimination of the reserve clause permitted baseball player compensation to go up because “property rights were transferred from the team to the players.”²⁶⁸ In short, Dr. Topel has conceded the basic economics of a key mechanism by which the challenged contracts suppress Fighter compensation: By restricting athlete mobility, Zuffa’s contracts reduce the availability and attractiveness of outside offers, enhance Zuffa’s negotiating leverage and monopsony power, and transfer value from the Fighters to Zuffa. This permits Zuffa to pay Fighters less than they would be paid in a competitive environment absent the challenged contracts.

B. Dr. Topel Improperly Discards Data from My Impact Regressions Without Any Basis In Standard Econometric Principles

72. As explained above, according to elementary economic theory, the more monopsony power that a firm enjoys, the more it can suppress compensation below workers’ MRP.²⁶⁹ Consistent with basic economics, the impact regressions in my initial report analyze Fighter compensation expressed as a share of Event Revenues—that is, Fighter wage share. Given that Fighter MRP cannot be measured directly, my impact regressions use Event Revenue—the amount of revenue generated at a Live MMA Event—as a proxy for the MRP of the Fighters competing in that event. Event Revenue is calculated from various revenue streams specific to a given Live MMA Event, such as Ticket Sales and PPV revenue.²⁷⁰ Event Revenue is therefore closely related to the MRP of the Fighters participating in a given Live MMA Event.²⁷¹

267. *Id.* at 92:10-18.

268. *Id.* at 140:19-22. *See also* Blair Dep. at 37:14-17, 98:22-99:7.

269. *See, e.g.,* Blair Sports Econ at 354.

270. As explained in my initial report, the Event Revenue used in my regression analysis were calculated using Zuffa’s P&L statements, and include Ticket Sales/Site Fees PPV/Broadcast Sales/Fees (including “Web Buys” and “Other”), event-specific Merchandise, and event-specific Sponsorships. Singer Report ¶181, n. 451.

271. Dr. Topel opined in his report and in his deposition that Zuffa’s Fighters are “effective revenue generators.” Topel Dep. at 24:20-25:9 (“Q. Okay. So if what Zuffa does is . . . makes its fighters more effective revenue

73. The impact regressions in my initial report are designed to test the hypothesis that an increase in Zuffa's foreclosure of the Relevant Input Market (or Submarket) allows Zuffa to exercise more monopsony power, by paying Fighters a smaller share of Event Revenue than Fighters would otherwise receive. The regression identifies this effect using two sources of variation, namely: (1) variation in Zuffa's own compensation practices over time (that is, when it had a lower foreclosure share, and thus less monopsony power, historically); and (2) variation between Zuffa's compensation practices and those of Strikeforce before Zuffa acquired it (that is, an entity with much smaller share of the Relevant Input Market).²⁷²

74. With respect to (1)—variation in Zuffa's own compensation practices over time—if the Challenged Conduct does in fact permit Zuffa to exercise monopsony power, then, all else equal, Zuffa's Fighter compensation will decline as a proportion of Event Revenue as Zuffa's foreclosure share increases over time. In particular, an increase in Fighter MRP will cause both Fighter compensation and Event Revenue to increase. However, Fighter compensation will increase by less than Event Revenue because Zuffa's increased monopsony power gained through growing foreclosure of the Relevant Input Market permits it to keep more of the Event Revenue for itself and pay its own Fighters a smaller share of their MRP, and thus a smaller share of Event Revenue.

generators, then what you were saying is that Zuffa in this example is causing the marginal revenue product of its fighters to increase, correct? A. Yes. Q. And is it your opinion that Zuffa is particularly good at causing its fighters to be more effective revenue generators? A. I think that's Zuffa's position and I think that's what the evidence tends to show, yes. Q. Is it your opinion? A. I just said yes.”). Dr. Topel also conceded that both Fighter compensation and Event Revenue are positively related to the willingness to pay to watch MMA fighters. *Id.* at 420:10-29. *See also id.* at 36:24-37:4 (“Q. What you’re saying is that one of the ways in which Zuffa has become successful is by boosting the ability of its fighters to generate revenues when they fight, correct? A. Yeah. The point of investing is to generate revenues.”); *see also* Topel Report ¶311. Similarly, Dr. Oyer concedes that “[h]aving good fighters” is one factor that would increase Zuffa's revenue. Oyer Report ¶36. *See also* Richard McGowan and John Mahon, *Demand for the Ultimate Fighting Championship: An Econometric Analysis of PPV Buy Rates* 6(6) J. BUS. & ECON. 1032-1056 (2015) [hereafter “McGowan & Mahon (2015)”].

272. Singer Report ¶183.

75. With respect to (2)—variation between Zuffa’s compensation practices and those of Strikeforce before Zuffa acquired it—if the Challenged Conduct does in fact permit Zuffa to exercise more monopsony power than other MMA promoters with a smaller share of the Relevant Input Market, then, all else equal, Zuffa will pay its Fighters a smaller share of Event Revenue than the share of Strikeforce’s Event Revenue that Strikeforce paid to its Fighters. To the extent that Fighter MRP at Zuffa is higher than Fighter MRP at Strikeforce,²⁷³ both Fighter compensation and Event Revenue will be higher at Zuffa, relative to Strikeforce. However, the discrepancy in Event Revenue will exceed the discrepancy in Fighter compensation, because Zuffa’s monopsony power permits it to pay its own Fighters a smaller share of their MRP (and thus Event Revenue), relative to Strikeforce.²⁷⁴ If the Challenged Conduct did not enhance Zuffa’s monopsony power, then neither (1) nor (2) would have yielded any statistically or economically significant effects. But, as my model demonstrates, they did yield statistically and economically significant effects: Zuffa’s increasing foreclosure of the Relevant Input Market leads to a reduced share of Event Revenue paid to Fighters.

76. Therefore, the data set used to estimate my impact regression models includes data for *both* Zuffa Fighters *and* for Strikeforce Fighters prior to Zuffa’s acquisition of Strikeforce.²⁷⁵ As explained below, Dr. Topel improperly discards the Strikeforce pre-acquisition data from my

273. Dr. Topel admitted in his deposition that none of the competitors that Zuffa acquired (WFA, WEC, Pride, Strikeforce) had been able to challenge Zuffa’s market share in either the input or output markets. *See* Topel Dep. at 370:25-371:13. *See also* Singer Report ¶¶134-140 (explaining that market observers and participants viewed Zuffa as dominant); *id.* ¶¶156-166 (Zuffa foreclosed rivals from access to top-ranked fighters with the highest revenue-generating potential).

274. [REDACTED]

275. *Id.* ¶181.

impact regressions without any basis in standard econometric principles, and in direct contradiction to his own claims.

1. Strikeforce Is a Valid Competitive Benchmark

77. As Zuffa's economists recognize, Strikeforce is a valid competitive benchmark. Indeed, Dr. Topel opines *in his own report* that Strikeforce is a [REDACTED] [REDACTED]²⁷⁶ Dr. Topel agrees as well that Strikeforce and Zuffa operated in the same market, and that Strikeforce lacked market power in that market.²⁷⁷ Dr. Topel also uses Strikeforce as a competitive benchmark in his own analysis.²⁷⁸ But when critiquing my impact regressions, which make use of pre-acquisition Strikeforce data, Dr. Topel reverses course, claiming that [REDACTED]²⁷⁹ and seeking to discard all Strikeforce data from my analysis.²⁸⁰

78. [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

276. Topel Report ¶287. Dr. Blair recognizes that "Bellator (and Strikeforce before it) competed against Zuffa in the market, and were thus subject to market forces in part affected by Zuffa's competition." Blair Report ¶73.

277. Topel Dep. at 303:24-304:7 ("Q. Strikeforce was in the same market as Zuffa, correct? A. Yes. Q. They're in the same business as Zuffa was? A. Yes. Q. And in your view Strikeforce doesn't have market power or didn't test, correct? A. That's my view."). *See also id.* at 370:12-15 ("Q. Did Strikeforce have a significant share of the input or output markets at the time it was taken over by Zuffa? A. Evidently not."). Dr. Topel also testified that to isolate the impact of the Challenged Conduct, an economist needs a "controlled experiment about a *firm in similar circumstances* [that] employed people and paid people or maybe in some identifiably *similar circumstances*." *Id.* at 59:15-19.

278. Topel Report ¶¶286-288.

279. *Id.* ¶¶151-156.

280. *Id.*

281. ZFL-2463304 at 9.

282. *See* <http://www.sherdog.com/organizations/Strikeforce-716>

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

79. As explained below, Dr. Topel has no basis in standard econometric principles for discarding Strikeforce data from my impact regressions. To the contrary, standard econometric tests implemented in my initial report and discussed further below provide further confirmation that Strikeforce is a valid competitive benchmark.

2. The Chow Test Is Not a License to Discard Data

80. Based on the results of an econometric test known as a Chow test, Dr. Topel concludes that the Strikeforce pre-acquisition bouts should be discarded from the regression.²⁸⁶ As explained below, Dr. Topel is wrong: The Chow test does not provide any basis for discarding these data. By treating the Chow test as if it were a license to discard inconvenient data, Dr. Topel violates basic econometric principles.

81. [REDACTED]

[REDACTED]

283. ZFL-2463304 at 14.

284. [REDACTED]

285. According to Dr. Blair, to evaluate a yardstick (or benchmark) one examines “are these entities comparable in a variety of things? ... are they offering ... the same product? Do they have the same quality management? ... are they engaged in the same sort of promotion? ... to the extent that the goods and services being produced by the yardstick are different ... are they similar enough so that, again ... the purpose of the yardstick analysis is to draw an inference about the plaintiff based on the performance of the yardstick.” Blair Dep. at 335:24-336:9.

286. Topel Report ¶¶155-156.

[REDACTED]

82. [REDACTED]

[REDACTED]

287. JEFFREY WOOLDRIDGE, INTRODUCTORY ECONOMETRICS: A MODERN APPROACH 243 (Thompson 4th ed. 2009) (explaining that the “null hypothesis [of the Chow test is] that two populations or groups follow the same regression function, against the alternative that one or more of the slopes differ across the groups”) [hereafter “Wooldridge”].

288. *Id.* at 245.

PUBLIC COPY - REDACTED

Strikeforce pre-acquisition bouts are a valid competitive benchmark. Moreover, my impact regressions also continue to show classwide impact and damages even after controlling for other potential differences between the Zuffa bout data and the Strikeforce pre-acquisition bout data, such that if there were indeed differences between these two data sources, the model would account and control for such differences.

3. Correct Application of the Chow Test Shows Classwide Impact and Damages, As Demonstrated in My Initial Report and Confirmed by Additional Analyses

84. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

295. Wooldridge at 243-246.

296. Topel Dep. at 311:4-13.

297. [REDACTED]

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

85. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

4. Dr. Topel Makes False Claims Regarding the Strikeforce Pre-Acquisition Bouts

86. [REDACTED]

[REDACTED]

298. See Appendix Table A1.

299. *Id.*

300. *Id.*

301. This conclusion is supported by additional evidence reviewed in my initial report. See Singer Report ¶¶182-183, ¶190. See also Part II.B.1, *supra* (explaining that Strikeforce is a valid competitive benchmark, as Dr. Topel himself has admitted).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

87. [REDACTED]

[REDACTED]

-
302. Singer Report ¶249.
303. Topel Report ¶157.
304. *Id.* ¶¶157-160.
305. *Id.* ¶158; *id.* Exhibit 15, columns (1) – (3).
306. [REDACTED]

[REDACTED]

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

307. Topel Report ¶157.

308. ABA Antitrust Damages at 130.

309.

310.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

C. Zuffa's Expert Economists Falsely Claim That Wage Shares Play No Role in Standard Economic Analyses of Market Power

88. Drs. Topel, Oyer, and Blair claim that the share of event revenue paid to labor—the dependent variable in my regressions—is an inappropriate focus of analysis for an economist. Dr. Topel claims that “standard economic models of competitive labor markets make predictions about the *level* of worker pay, not about worker pay as a *share* of revenue.”³¹¹ Similarly, Dr. Oyer claims that “labor share is not an economically accepted way to evaluate worker compensation,”³¹² and that “[l]abor share is not generally accepted in the field of labor economics as a method for determining compensation in a competitive labor market[.]”³¹³ Although Dr. Blair does not address my analysis specifically, he claims that Professor Zimbalist’s analysis of the “labor share of total revenue going to athletes... and the labor share going to the athletes in UFC... is inconsistent with standard principles of economics.”³¹⁴ Drs. Topel and Oyer claim that the absolute level of worker pay is the one and only metric suitable for the analysis of monopsony power.³¹⁵ None of Zuffa’s expert economists offers a citation to any authority, legal or economic, supporting these categorical and erroneous claims regarding use of labor (or wage) share as a mode of analysis.³¹⁶

89. As explained below, Zuffa’s economists’ claims are demonstrably false as a matter of both economic theory and applied economics. Standard economic models do, in fact, make predictions regarding and using wage shares. In labor markets for professional athletes, and in other industries where incremental revenue is directly traceable to a worker’s efforts, wage shares

311. Topel Report Part VI.B. (emphasis added).

312. Oyer Report Part V.A.

313. *Id.* ¶30.

314. Blair Report ¶12.

315. Oyer Report ¶¶17-19; Topel Report ¶¶129-132.

316. Indeed, the Oyer Report provides no citations in ¶¶28-31, other than to my deposition transcript.

are used by economists to analyze market power of firms relative to workers. Dr. Oyer offers a useful analogy to salespeople, opining that for such workers “we have very good measures that do a good job of approximating their marginal product of labor.”³¹⁷ This traceable connection between certain workers’ MRP and incremental revenue is precisely why Uber drivers are paid a percentage of their fares, and why, as Dr. Oyer observes, salespeople are paid a commission equal to percentage of their sales generation (a wage share).³¹⁸

90. As explained below, in sports economics, a standard approach spanning decades has been to measure athlete compensation relative to some measure of the revenue generated by athletes.³¹⁹ As Zuffa’s own economists concede, according to elementary economic principles, when an employer exercises monopsony power, workers are underpaid relative to the *marginal revenue* that they generate—that is, their MRP.³²⁰ Consistent with this logic, Dr. Topel’s own consulting work has implemented a detailed analysis of labor shares in professional football.³²¹ More generally, economists have analyzed wage shares in various industries, in everything from basic economics textbooks to cutting-edge academic articles—including in economic literature cited by Dr. Oyer.³²² Dr. Oyer’s own published work recognizes the significance of share-based

317. Oyer Dep. at 81:25-82:4

318. See Oyer Report ¶16. As another example, in *Johnson v. AzHHA*, the court’s class certification opinion recognized the significance of temporary nurses’ incremental revenue in determining nurse compensation, noting that “Dr. Singer cites deposition testimony...that nurses were paid somewhere between 70 and 76 percent of the revenues the agency took in from a hospital paying AzHHA Registry-determined [bill] rates.” Because temporary nurses’ compensation was a percentage of their billings, the Court also recognized that “it stands to reason that...if bill rates were to rise, so would temporary nursing wages.” See *Johnson v. Arizona Hospital & Healthcare Ass’n*, No. CV 07-1292-PHX-SRB (D. Ariz. 2009), at 12-13.

319. See Part II.C.1, *infra* (pages 72-80).

320. Oyer Report ¶18. Dr. Topel admits that standard monopsony models relate a worker’s pay with “the value of a worker’s marginal product.” Topel Report ¶130.

321. See Kevin Murphy & Robert Topel, “The Economics of NFL Team Ownership,” Chicago Partners (2009) [hereafter, “Murphy and Topel”], at 2, 15-16; see also Topel Dep. at 230:12-231:7.

322. See Part II.C.2, *infra* (pages 80-86).

analysis in labor economics, including in the context of evaluating monopsony power.³²³ It is therefore curious that Dr. Oyer and Dr. Topel, in the context of this case, would categorically disavow the use of labor shares to evaluate the exercise of monopsony power.

91. When presented with several articles from the sports economics literature analyzing athletes' share of revenue to assess monopsony power, Dr. Oyer admitted in his deposition that numerous studies did in fact use wage share, not wage levels, and that he was unfamiliar with this body of empirical labor economics.³²⁴ Even Dr. Topel himself has used wage shares in his capacity as a consultant to the NFL Players' Association to study the impact of the 2006 Collective Bargaining Agreement on revenue allocation between players and owners.³²⁵ When confronted with his own work, Dr. Topel revised his opinion that wage shares are never used. He adopted instead the equally untenable and incoherent position that wage shares are used to study only the impact of *ending* monopsony power but not used to study the *existence* or exercise of monopsony power.³²⁶

323. *Id.*

324. *See, e.g.*, Oyer Dep. at 104:12-18 (“Q. Okay. And without reviewing the paper any further, are you aware that Professor Scully analyzed compensation as a share of revenue for Major League Baseball, the National Basketball Association, the National Football League, and the National Hockey League to assess monopsony power? A. I was not aware of that.”). *See also* Oyer Dep. at 105:3-110:4 (discussing Lawrence Kahn, *The Sports Business as a Labor Market Laboratory*, 14(3) JOURNAL OF ECONOMIC PERSPECTIVES 75-94 (2000) [hereafter “Kahn (2000)”]); Oyer Dep. at 110:5-113:6 (discussing John Vrooman, *Theory of the Perfect Game: Competitive Balance in Monopoly Sports Leagues*, 34(1) REVIEW OF INDUSTRIAL ORGANIZATION 5-44, 42 (2009)); Oyer Dep. at 114:23-117:6 (discussing Monks (2013)); Oyer Dep. at 117:9-119:4 (discussing ROBERT PINDYCK & DANIEL RUBINFELD, MICROECONOMICS 549 (Pearson 8th ed. 2013)). Dr. Oyer admitted that this is a “well respected” and standard economics textbook. Oyer Dep. at 13:24-14:4; 14:10-11.

325. Murphy and Topel, at 2 (“The percentage of total revenues paid to players in the years following the 2006 CBA extension is lower than the average percentage paid to players since the NFL and the players entered into the current salary cap/free agency system in 1993. Recent increases merely reverse evidence of a downward trend that began in 1999.”). *See also* Topel Dep. at 230:12-231:7.

326. Topel Dep. at 217:4-18.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

1. Sports Economists Commonly Analyze Market Power Using the Share of Revenue Paid to Athletes

92. According to basic economic principles, labor in a competitive market receives compensation equal to its MRP, defined as the dollar value of what a worker produces.³²⁷ When the labor market is not competitive, employers exploit their monopsony power to pay workers less than their MRP.³²⁸ As Dr. Oyer correctly observes, “in a ‘monopsonistic’ labor market where a firm has market power over its workers, the firm will pay its workers less than their marginal [revenue] product of labor.”³²⁹

93. MRP plays the same role for the monopsonist in wage setting as marginal cost plays in price setting by a monopolist. In the case of monopoly, the exercise of market power drives the price charged to customers *above* marginal cost;³³⁰ in the case of monopsony, the exercise of market power drives the wage paid to labor *below* the MRP.³³¹ Therefore, monopsony power can be and is measured by economists as the ratio of (1) the amount that workers are actually paid to (2) the incremental revenue that workers generate—that is, their MRP. Economists have frequently performed such analyses in the market for professional athletes, given the relatively clear connection between athlete performance and incremental employer revenue. Professional sports provides “an ideal ‘laboratory’ to study worker compensation”³³² because it offers detailed information relating to both compensation and MRP for individual athletes.

327. KATZ & ROSEN at 312-315; *see also* Fort Sports Econ at 206 (“In a competitive talent market, we expect that players get paid pretty close to their MRP.”).

328. *See, e.g.*, Blair Sports Econ at 354 (explaining that, when professional athletes are paid less than their MRP, “[t]his is *exploitation* in the sense that the player is paid less than his value to the club”) (emphasis in original).

329. Oyer Report ¶18. In his deposition, Dr. Oyer clarified that he equates “marginal product” with “marginal revenue product.” Oyer Dep. 16:6-18.

330. KATZ & ROSEN at 417-419.

331. Blair Sports Econ at 354.

332. David Berri, Michael Leeds, & Peter von Allmen, *Salary Determination in the Presence of Fixed Revenues* 10 INTERNATIONAL JOURNAL OF SPORT FINANCE 5-25 (2015), at 6. *See also* Kahn (2000).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

94. The sports economist Gerald Scully “produced the first—truly pioneering—work on this difficult subject,”³³³ which “provided valuable insights into the dramatic disparity between pay and performance in [Major League Baseball] before the advent of free agency.”³³⁴ Specifically, in a 1974 paper published in the prestigious *American Economic Review*,³³⁵ Professor Scully³³⁶ did not simply examine the absolute *level* of compensation paid to athletes. Professor Scully recognized that compensation levels can be highly misleading: Professional sports have seen substantial growth in revenues over time. A singular focus on compensation levels would likely reveal substantially rising athlete salaries. But looking at compensation levels alone—as Zuffa’s economists propose to do here—would miss the real story where athlete compensation is growing *at a far slower rate than the revenues athletes are generating for their respective teams or firms, that is, their MRP*.³³⁷ Thus, Professor Scully analyzed player compensation as a *percentage* of the revenues that athletes generate for their teams. If one ignores the revenues that athletes generate for teams, it is difficult or impossible to determine whether athletes are being paid a competitive wage or the degree to which compensation reflects monopsony power. Professor Scully found that athlete salaries came to only about 15 to 20 percent of athlete MRP, and concluded that, before free agency (in the late 1960s), “monopsonistic exploitation was

333. Blair Sports Econ at 354-55.

334. *Id.*

335. Gerald Scully, *Pay and Performance in Major League Baseball*, 64 AMERICAN ECONOMIC REVIEW, 915-930 (1974) [hereafter “Scully (1974)”].

336. Professor Scully’s obituary states that he authored “Landmark Baseball Analyses.” See Bruce Weber, *Gerald W. Scully, Who Wrote Landmark Baseball Analysis, Dies at 67*, NEW YORK TIMES, June 6, 2009, available at <http://www.nytimes.com/2009/06/07/sports/baseball/07scully.html>.

337. Scully (1974) at 915 (explaining that “[baseball] owners insist that player salary demands are unrealistically high...Somehow, a \$150,000 a year ball player claiming exploitation is anti-heroic”). A 2013 article published in the *Journal of Sports Economics* explains that analyzing compensation in levels requires data on comparable and truly competitive compensation that serves as a benchmark. If the benchmark is contaminated, in the sense that it reflects the exercise of monopsony power, then the levels-based approach will yield systematically biased results. See John Charles Bradbury, *What is Right with Scully Estimates of a Player’s Marginal Revenue Product*, 14(1) JOURNAL OF SPORTS ECONOMICS 87-96 (2013) [hereafter, “Bradbury”] at 93.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

significant”³³⁸ in the labor market for professional baseball players. In subsequent work, Professor Scully found that players earned a somewhat higher fraction of their MRP as of the late 1980s, indicating that monopsony power in baseball was still present, but not as pronounced, at that time.³³⁹ Professor Scully’s trailblazing approach has been applied in many peer-reviewed papers.³⁴⁰

95. Economists also recognize that directly measuring athlete MRP is “fraught with difficulties and complexities under the best of circumstances.”³⁴¹ As an alternative or proxy for MRP, “[e]conomists have often used the share of revenue returned to the players in the form of salaries as evidence of the degree of monopsony control.”³⁴² For example, in a 2004 article published in *Managerial and Decision Economics* titled “Player Salary Share and the Distribution of Player Earnings,” Professor Scully explained that:

While all professional team sports had monoposonistic labor markets in the past, all have veteran free agency now. This change from a restricted to a free labor market (at least for

338. Blair Sports Econ at 355.

339. Kahn (2000) at 82-83.

340. *Id.* at 82. *See also* Bradbury, *supra*; *see also* GERALD SCULLY, *THE BUSINESS OF MAJOR LEAGUE BASEBALL* (University of Chicago Press 1989), Chapter 8; Roger G. Noll, *Attendance and Price Setting*, in ROGER G. NOLL, *GOVERNMENT AND THE SPORTS BUSINESS*, 115-157 (Brookings Institution, 1974); Ira Horowitz, *Sports Broadcasting*, in ROGER G. NOLL, *GOVERNMENT AND THE SPORTS BUSINESS*, 275-323 (Brookings Institution, 1974); Gerald W. Scully, *Binding Salary Arbitration in Major League Baseball*, 21(3) *AMERICAN BEHAVIORAL SCIENTIST* 431-450 (1978); James Cassing and Richard W. Douglas, *Implications of the Auction Mechanism in Baseball’s Free Agent Draft*, 47(1) *SOUTHERN ECONOMIC JOURNAL* 110-121 (1980); Paul M. Sommers and Noel Quinton, *Pay and Performance in Major League Baseball: The Case of the First Family of Free Agents*, 17(3) *THE JOURNAL OF HUMAN RESOURCES* 426-436 (1982); Henry J. Raimondo, *Free Agent’s Impact on the Labor Market for Baseball Players*, 4(2) *JOURNAL OF LABOR RESEARCH* 183-93 (1983); James R. Hill and William Spellman, *Professional Baseball: The Reserve Clause and Salary Structure*, 22(1) *INDUSTRIAL RELATIONS* 1-19 (1983); Rodney D. Fort and Roger G. Noll, *Pay and Performance in Baseball: Modeling Regulars, Reserves and Expansion*, California Institute of Technology Social Science Working Paper 527 (May 1984), available at <https://authors.library.caltech.edu/81597/1/sswp527.pdf>; Roger G. Noll, *The Economics of Sports Leagues* in GARY A. UBERSTINE, *LAW OF PROFESSIONAL AND AMATEUR SPORTS* (Clark Boardman 1988).

341. Monks (2013) at 3. *See also* Anthony Krautmann, *What’s wrong with Scully-Estimates of a Player’s Marginal Revenue Product* 37(2) *ECONOMIC INQUIRY* 369-381 (1999).

342. Monks (2013) at 3. Dr. Blair conceded that measuring the marginal revenue product of athletes is difficult in practice. Blair Dep. at 305:7-11 (Supposing there are only two inputs to an MMA events, athletes and venues, “revenue [is] zero if either one of those things is zero. So, having put on the event ... allocating ... a portion of the revenue to each of them would be ... pretty difficult.”).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

eligible veteran players) creates a natural experiment in which the effects of freedom of the market can be examined and measured.³⁴³

In performing this analysis, Professor Scully calculated compensation as a share of revenue for Major League Baseball (“MLB”), the National Basketball Association (“NBA”), the National Football League (“NFL”), and the National Hockey League (NHL). He found that, for each sport, compensation increased substantially *as a share of revenue* after free agency was introduced. Specifically, Professor Scully found that MLB player salaries increased from 15.9 percent of revenue in the 1970-73 period to 48.4 percent in 1998. In the NBA, the increase was from 46.1 percent to 54.2 percent. In the NFL, players’ share of revenue increased from 34.4 percent to 55.4 percent. In the NHL, the increase was from 21.3 percent to 58.4 percent.³⁴⁴

96. Professor Scully also explained that, although free agency for veteran athletes had already resulted in approximately 50 percent of revenue being paid to professional athletes, additional liberalization of labor-market restrictions on non-veteran players could increase the share of revenue paid to athletes still further:

If one takes the American economy as a whole, labor compensation is about 75% of national output. One would expect that under unrestricted free agency for all players the upper bound on player compensation as a share of revenue in team sport would approach about 70%.³⁴⁵

Accordingly, labor’s share of revenue (or output) is a highly relevant measure of competition in labor markets.

97. Other sports economists have reached similar conclusions based on similar analyses. An article published in 2000 in the prestigious *Journal of Economic Perspectives* notes that “baseball salaries as a percentage of team revenues rose from 17.6 percent in 1974 to 20.5

343. Gerald Scully, *Player Salary Share and the Distribution of Player Earnings*, 25(2) MANAGERIAL AND DECISION ECONOMICS, 77-86, 77 (2004).

344. *Id.*, Table 1.

345. *Id.* at 80.

percent in 1977 to 41.1 percent in 1982, further suggesting that free agency has had a structural effect on baseball salary determination.”³⁴⁶ The author goes on to explain that the share of revenue paid to baseball players temporarily declined when owners attempted to reassert monopsony power in the 1980s:

[I]n a series of grievance arbitration decisions in the 1980s, the [baseball] owners were found guilty of colluding by not making offers to free agents...[S]alaries as a percent of revenues fell from about 40 percent in 1985 to 32 percent in 1989 during the collusion period. In 1989, arbitrators levied a \$280 million back pay penalty on the owners to be paid out over the 1989-91 period as compensation for the losses imposed by collusion, and salaries as a percent of revenue bounced back to 43 percent by 1991. The collusion episode provides a further illustration of the potential impact of monopsony on salaries.³⁴⁷

In a 2009 article published in the *Review of Industrial Organization*, Professor John Vrooman concludes that:

As the result of internal competition among sportsman owners, monopsonistic exploitation has virtually vanished over the last decade in all [major professional sports] leagues. All leagues have similar carrying capacities for player costs at *two-thirds of revenues* and current payroll cap percentages are almost identical at about 60 percent.³⁴⁸

This finding, which directly connects (reduced) monopsony power with (increased) wage shares, is both absent from, and directly contradicts, Zuffa’s economists’ sweeping claims that “it’s never been done that way.” Indeed, none of Zuffa’s economists even cites any of the wage share literature I discuss and evaluate from the sports economics field or otherwise.

98. In a 2012 publication, Professor Vrooman analyzes players’ share of revenue in the NFL, specifically in light of the “NFL owners’ considerable monopsony power.”³⁴⁹ In an article published in 2011, Professors Twomey and Monks analyze revenue shares as a means to infer the

346. Kahn at 75-94, 81 (citing ANDREW ZIMBALIST, *BASEBALL AND BILLIONS* (New York: Basic Books 1992)).

347. *Id.*

348. John Vrooman, *Theory of the Perfect Game: Competitive Balance in Monopoly Sports Leagues*, 34(1) *REVIEW OF INDUSTRIAL ORGANIZATION* 5-44, 42 (2009) (emphasis added).

349. John Vrooman, *The Economic Structure of the NFL* in *THE ECONOMICS OF THE NATIONAL FOOTBALL LEAGUE: THE STATE OF THE ART*, 7 *SPORTS ECONOMICS, MANAGEMENT AND POLICY* 22-25, 29 (K.G. QUINN ED., Springer 2012).

exercise of monopsony power by major league soccer (“MLS”) in the United States.³⁵⁰ The authors find that the MLS has a “monopsonistic structure that was designed to eliminate competition for players across teams within the league,”³⁵¹ and that the MLS devotes “only about 25 percent of its revenues to player salaries, compared to 50 to 60 percent in most other U.S. professional sports and professional soccer leagues”³⁵² They conclude that, *in light of the disparity in wage shares between MLS and these other professional sports*, the MLS has been effective in exercising monopsony power over its athletes.³⁵³

99. In a 2013 study, Professor Monks explains that the National Collegiate Athletic Association “operates as a collusive monopsony in the labor market for athletic (player) talent,”³⁵⁴ and analyzes “the degree to which the NCAA’s cap on player remuneration...restricts the *share of revenue* returned directly to the players, in comparison to professional athletic leagues in the United States.”³⁵⁵ Professor Monks concludes:

The major professional sports leagues in the United States (baseball, basketball, football, and hockey) all have negotiated aggregate salaries that represent over fifty percent of league-wide revenues. In comparison...intercollegiate athletes receive payments-in-kind, via athletic scholarships, that constitute less than 22 percent of total athletic department *revenues*. Clearly the monopolistic practices of the NCAA are effective in restricting the compensation of athletes.³⁵⁶

350. John Twomey & James Monks, *Monopsony and Salary Suppression: The Case of Major League Soccer in the United States*, 56(1) THE AMERICAN ECONOMIST 20-28 (2011).

351. *Id.* at 20.

352. *Id.*

353. *Id.*

354. Monks (2013) at 2.

355. *Id.* (emphasis added); *see also id.* at 3 (“A common method of estimating the degree of monopsony control of an industry or employer is to compare the marginal revenue product of an athlete to his or her compensation. This exercise is fraught with difficulties and complexities under the best of circumstances, and clearly is untenable when considering millions of athletes across numerous sports. An alternative mechanism for establishing the degree of monopsony control *in a sporting industry* is to examine the share of revenue returned to the players. *Economists have often used the share of revenue returned to the players in the form of salaries as evidence of the degree of monopsony control.*”) (Emphasis added).

356. *Id.* at Abstract (emphasis added).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

100. Elementary economics textbooks also discuss the relationship between the degree of monopsony power wielded by professional sports leagues, on the one hand, and the *share of revenue* paid to professional athletes, on the other. One standard microeconomics textbook by Professor Robert Pindyck of MIT and Professor Daniel Rubinfeld of the University of California-Berkeley notes that:

The result [of the elimination of the reserve clause] was an interesting experiment in labor market economics... Before 1975, expenditures on players' contracts made up approximately 25% of all team expenditures. By 1980, those expenditures had increased to 40%.³⁵⁷

Another introductory microeconomics textbook summarizes the “impact of free agency” in professional sports by observing that “[f]ree agency has increased player *share of total revenues* in each of the major men’s team sports.”³⁵⁸

101. Consistent with these analyses, in his consulting work, Zuffa’s own expert Dr. Topel has analyzed payments to labor as a share of revenue in labor markets for professional athletes.³⁵⁹ In a study commissioned by NFL Players Association, Dr. Topel analyzes “[t]he percentage of total revenues paid to [NFL] players.”³⁶⁰ Based on an analysis of “Total Cash Player Costs as a Percentage of Total Revenue,”³⁶¹ the study finds that:

[P]layers’ percentage did not keep pace with the growth in NFL revenues after 2000. To the extent the 2006 CBA [Collective Bargaining Agreement] extension resulted in increases in the salary cap, those increases have raised the players’ percentage so that it is closer to the historical average of approximately 59 percent of revenue. Reducing the players’ percentage, as the owners suggest, would not redress a situation in which the players are

357. ROBERT PINDYCK & DANIEL RUBINFELD, MICROECONOMICS 549 (Pearson 8th ed. 2013). Dr. Oyer admitted that this is a “well respected” and standard economics textbook. Oyer Dep. at 13:24-14:4; 14:10-11.

358. LIBBY RITTENBERG & TIMOTHY TREGARTHEN, PRINCIPLES OF MICROECONOMICS 356 (Flat World Knowledge 2009) (emphasis added).

359. Kevin Murphy and Robert Topel, “The Economics of NFL Team Ownership,” Chicago Partners (2009) (prepared at the request of the National Football League Players’ Association).

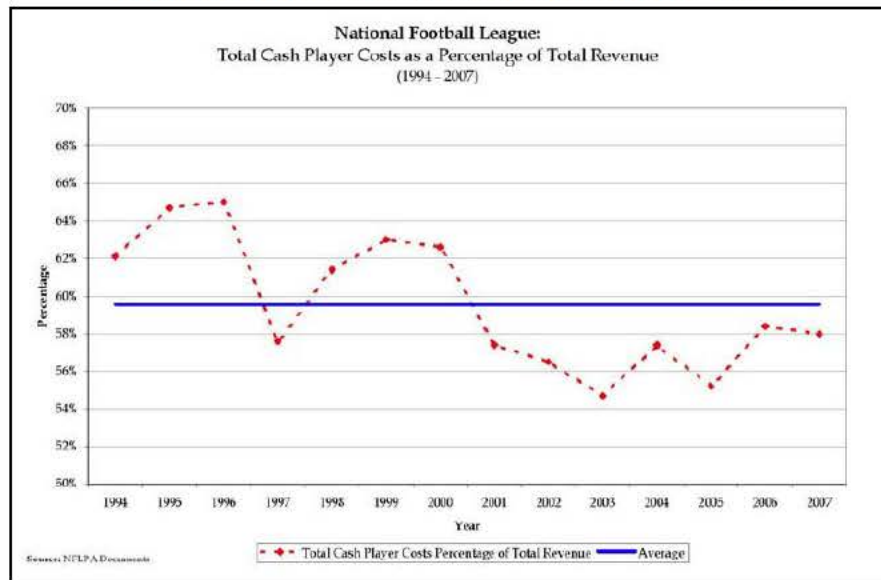
360. *Id.* at 2.

361. *Id.* at 15 (Figure 12).

receiving a higher than average percentage, but would instead reduce the players' percentage to a level below the historical average.³⁶²

Dr. Topel even included a figure (reproduced below) showing the football players' share of total revenue over time.

FIGURE 1:
EXAMPLE OF LABOR SHARE ANALYSIS BY DR. TOPEL



Source: Murphy and Topel, *supra*, Figure 12.

The study goes on to analyze compensation to rookie players as a percentage of team salary caps, and finds that “the average rookie pool has declined relative to the per team salary cap from approximately 7 percent in 1994 to just under 4 percent in 2008.”³⁶³

102. Dr. Topel’s extensive focus on the percentage of revenue paid to NFL players is inconsistent with Dr. Oyer’s claim that “labor share is not an economically accepted way to evaluate worker compensation,”³⁶⁴ as well as Dr. Topel’s patently incorrect claim in this case that

362. *Id.* at 15.

363. *Id.* at 16. In addition, Dr. Blair himself compared UFC athlete share of revenue to that in other sports in a presentation to the FTC. Blair Dep. at 254:25-255:3 [REDACTED]

[REDACTED] Thus, in his capacity as an economic consultant, Dr. Blair has analyzed wage shares in MMA.

364. Oyer Report Part V.A.

standard microeconomics has nothing to say about the percentage of revenue paid to workers.³⁶⁵ Dr. Topel does not mention his own prior work analyzing labor shares in his expert report, just as he fails to review the sports economics literature where use of wage shares as a means to evaluate the exercise of monopsony power is widespread.

2. Economists Have Also Studied Wage Shares in a Variety of Non-Sports Industries Including for Purposes of Assessing Monopsony Power

103. Economists have analyzed wage shares in a range of non-sports industries. Under competition, standard economic models predict that each input to production (including labor) receives its MRP, which in turn predicts the share of revenue paid to that input.³⁶⁶ Recognizing that “[i]n a world of perfect competition, the output contribution of individual production factors equals their respective revenue shares,”³⁶⁷ a 2013 study published in the *Journal of Applied Econometrics* analyze firm-level data from 38 manufacturing industries.³⁶⁸ The authors measure market power in these industries by analyzing discrepancies between the revenue shares that would be predicted for labor under an assumption of competitive markets, based on labor’s productivity, and those that are actually observed in the data.³⁶⁹

104. Another recent example, cited in the Oyer Report, is a 2017 paper, published in the prestigious *American Economic Review Papers and Proceedings*, titled “Concentrating on the Fall

365. Topel Report ¶¶130-132.

366. Elementary economics shows that competitive firms pay labor a share of revenue commensurate with labor’s productivity, based on the marginal product of labor. *See, e.g.*, ROY RUFFIN & PAUL GREGORY, PRINCIPLES OF MICROECONOMICS 331-36 (Harper Collins 5th ed. 1993) (explaining that standard economic theory makes predictions regarding the share of payments made to labor that are borne out in the data; economic theory explains why the share of payments going to labor remained relatively constant over several decades (from 1948 to 1990) even though the capital stock more than doubled over this time period).

367. *See, e.g.*, Sabien Dobbelaere & Jacques Mairesse, *Panel Data Estimates of the Production Function and Product and Labor Market Imperfections*, 28 JOURNAL OF APPLIED ECONOMETRICS 1-46, 2 (2013) [hereafter, “Dobbelaere & Mairesse”].

368. *Id.* at 3.

369. *Id.*

of the Labor Share.” This article provides an analysis of the broad-based decline in the labor share that has been observed in industries throughout the U.S. economy in recent decades.³⁷⁰ As Dr. Oyer observes correctly, the authors study “employee compensation costs *as a fraction of total revenues*....”³⁷¹ Based on their analysis of establishment-level data drawn from the U.S. Census, the authors find that the labor share has fallen the most in those industries where concentration and productivity have increased the most.³⁷² Strangely, the Oyer Report claims, based on this single study, that monopsony power cannot be invoked to explain declining labor shares in *any* industry (including presumably MMA).³⁷³ But the study reaches no such conclusion; its findings relate to broad-based trends spanning hundreds of industries.³⁷⁴ Moreover, as Dr. Oyer concedes, the authors of “Concentrating on the Fall of the Labor Share” mention “unfair practices on the part of firms”³⁷⁵ as a “a possible contributing factor”³⁷⁶ to the observed decline in the labor share.³⁷⁷ That the authors would even consider this hypothesis—let alone conduct an in-depth empirical analysis of labor shares in hundreds of industries to explore it—contradicts Dr. Oyer’s blanket claims

370. David Autor, David Dorn, Lawrence Katz, Christina Patterson, and John Van Reenen, *Concentrating on the Fall of the Labor Share*, 107(5) AMERICAN ECONOMIC REVIEW: PAPERS & PROCEEDINGS 180–185 (2017) [hereafter “Autor, et al.”]. The Oyer Report cites, at ¶33, a working paper version of the article, rather than the published version. See David Autor, David Dorn, Lawrence F. Katz, Christina Patterson, & John Van Reenen, “The Fall of the Labor Share and the Rise of Superstar Firms,” Working Paper (May 1, 2017), *available at*: <https://economics.mit.edu/files/12979>.

371. Oyer Report ¶33 (emphasis added).

372. Autor, et al. at 181, 184 (“The findings suggest that a positive productivity-concentration relationship will most likely feature in any plausible explanation of rising industry concentration.”).

373. Oyer Report ¶33. Dr. Oyer also cites a finding in the working paper version of Autor, et al. indicating that sectors with declining labor shares tend not to see declines in the absolute wage. *Id.* ¶34. It is unclear why Dr. Oyer believes this finding is inconsistent with my own analysis. Nothing in my analysis requires that labor shares and wage levels must move in the same direction. For example, if Fighters’ MRP is increasing over time, the level of compensation paid to fighters will also tend to increase, even when monopsony power is being exercised. The exercise of monopsony power would allow Zuffa to prevent Fighter compensation from increasing as rapidly as it would if Fighters were paid consistent with their MRP, as would be the case under competition. This explains why Fighter Share might decline when monopsony power is exercised, despite increases in the level of Fighter compensation.

374. Autor, et al. at 181 (“Our methodology yields 676 industries, 388 of which are in manufacturing.”).

375. Oyer Report ¶33.

376. *Id.*

377. *Id.*

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

regarding the use of labor shares by labor economists.³⁷⁸ The authors also provide a brief review of the economic literature on labor shares, starting in the 1960s and continuing through the present;³⁷⁹ as explained below, this literature includes studies that explicitly link the observed decline in the labor share to the exercise of monopsony power.

105. In his own published work, Dr. Oyer has recognized the significance of share-based analysis in labor economics. In a 2011 article published in the *Handbook of Labor Economics*, he reviews so-called “principal-agent” models of compensation, which analyze the ways in which firms provide incentives to their employees.³⁸⁰ As Dr. Oyer observes, the theory predicts that employers will structure their compensation according to an “optimal sharing rule,” which determines the share of output that employees are paid.³⁸¹ Dr. Oyer also recognizes that such sharing rules are “common in organizations.”³⁸² Put differently, share-based compensation is predicted by economic theory *and* is commonly observed in practice. Whenever incremental revenue is traceable to a worker’s effort, it makes sense to compensate the worker (in whole or in part) as a percentage of the incremental revenue generated by said employee; the incremental

378. As Dr. Oyer recognizes, Professor David Autor of MIT, the lead author of Autor. et. al., is a well-known labor economist. *Id.* Professor Autor has published a large number of articles on labor economics, including in the *Journal of Labor Economics*, which is edited by Dr. Oyer. See <https://economics.mit.edu/faculty/dautor/cv>

379. Autor, et al. at 180; *id.* at 185 (citing Nicholas Kaldor, *Capital Accumulation and Economic Growth*, THE THEORY OF CAPITAL, 177-222 (F.A. LUTZ AND D.C. HAGUE EDS. St. Martin’s Press 1961); Michael W.L. Elsby, Bart Hobijn, and Aysegul Sahin, *The Decline of the U.S. Labor Share*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY, 1-42 (2013) [hereafter “Elsby et. al.”]; Loukas Karabarbounis and Brent Neiman, *The Global Decline of the Labor Share*, 129 (1) QUARTERLY JOURNAL OF ECONOMICS, 61-103; Matthew Rognlie, *Deciphering the Fall and Rise in the Net Capital Share: Accumulation or Scarcity?*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY, 1-69 (2015); Simcha Barkai, “Declining Labor and Capital Shares,” University of Chicago New Working Paper Series No. 2 (November 2016), available at <https://research.chicagobooth.edu/~media/5872fbeb104245909b8f0ae8a84486c9.pdf>.

380. Paul Oyer & Scott Schaefer, *Personnel Economics: Hiring and Incentives*, in, IV THE HANDBOOK OF LABOR ECONOMICS, Ch. 20 (ORLEY ASHENFELTER AND DAVID CARD EDS. 2011).

381. *Id.* at 1774-1775.

382. *Id.* 1775. See also Oyer Dep. at 183:3-5; *id.* at 184:13-17 (“Q: So if the worker contributes to the firm acquiring some net revenue, this sharing rule could be used to determine what share of that revenue the employer should pay the worker; is that correct? A. Right.”); *id.* at 200:20-201:3 (admitting that in thicker, more competitive labor markets, employers get a smaller share of surplus, which is another way of saying a smaller share of revenue).

revenue serves as an upper bound on that worker's marginal revenue product. In his deposition, Dr. Oyer admitted that the payment to labor under the optimal sharing rule can be denominated in terms of share of Event Revenue.³⁸³

106. In the same article, Dr. Oyer also observes (correctly) that monopsony power allows firms to extract a greater share of production from labor than they could otherwise: He reviews economic literature documenting the fact that, all else equal, employers in more competitive ("thicker") labor markets are forced to pay a greater share of producer "surplus" to labor than are employers with more monopsony power:

Larger and more concentrated populations typically lead to thicker labor markets which may reduce search costs and can also lead to better average matches between firms and workers. While this will tend to increase surplus, *thicker labor markets also lead to greater competition in the labor market*. So, while total surplus may be greater in thicker labor markets, *firms may have to settle for a smaller share of that surplus because it is more difficult to generate monopsony power*.³⁸⁴

The *Handbook of Labor Economics* also includes a chapter by Professor Alan Manning,³⁸⁵ an economist cited frequently by Dr. Oyer.³⁸⁶ As Dr. Manning explains, there is an extensive theoretical and empirical literature in labor economics that examines "how rents [profits] are shared between employer[s] and worker[s]".³⁸⁷

383. Oyer Dep. at 183:3-5; *id.* at 185:11-15 ("Q: So if the worker contributes to the firm acquiring some net revenue, this sharing rule could be used to determine what share of that revenue the employer should pay the worker; is that correct? A. Yes.").

384. Oyer and Schaefer at 1813-14 (emphasis added), citing Christopher H. Wheeler, *Search, Sorting, and Urban Agglomeration*, 19 (4) JOURNAL OF LABOR ECONOMICS, 879-899 (2001); Fredrik Anderson, Simon Burgess, & Julia Lane, *Cities, Matching and the Productivity Gains of Agglomeration*, 61 (1) JOURNAL OF URBAN ECONOMICS, 112-128 (2007); M.L. Freedman, "Preference-based Sorting and Matching in Industrial Clusters" (Cornell University 2009); Luis Garicano & Thomas Hubbard, *Managerial Leverage is Limited by the Extent of the Market: Hierarchies, Specialization, and the Utilization of Lawyers' Human Capital*, 50 (1) THE JOURNAL OF LAW AND ECONOMICS, 1-43 (2007); Luis Garicano & Thomas Hubbard, *Specialization, Firms, and Markets: The Division of Labor Within and Between Law Firms*, 25 (2) THE JOURNAL OF LAW, ECONOMICS, & ORGANIZATION, 339-371 (2008).

385. Alan Manning, *Imperfect Competition in the Labor Market*, in IV THE HANDBOOK OF LABOR ECONOMICS, Ch. 11 (ORLEY ASHENFELTER AND DAVID CARD EDS 2011).

386. Oyer Report ¶¶22-24.

387. Manning, *supra*, at 997. *See also* Patrick Kline, Neviana Petkova, Heidi Williams & Owen Zidar, "Who Profits from Patents? Rent-Sharing at Innovative Firms," IRLE Working Paper #107-17 (September 2017). (Analyzing

107. Finally, Dr. Oyer attempts to dismiss share-based analysis of compensation as only relevant to macroeconomics, in studies of “wages as a fraction of Gross Domestic Product, some other macroeconomic measure of the size or the health of the economy, or a measure of the size of an entire sector of the economy.”³⁸⁸ Dr. Oyer also claims that “[t]hese studies do not equate labor’s share to the market power employers hold over labor.”³⁸⁹ Dr. Oyer is wrong here too. *First*, economists can and do apply the same fundamental class of economic models to microeconomic data. Indeed, the Autor, et al. (2017) paper cited by Dr. Oyer himself does not use macroeconomic data, but instead analyzes the labor share using *firm*-level data compiled from the U.S. Census, spanning over 600 industries.³⁹⁰ Thus, the very study Dr. Oyer cites is a microeconomic analysis, performed by labor economists.³⁹¹ Similarly, the 2011 *Journal of Applied Econometrics* publication cited above uses firm-level data, not macroeconomic data (such as gross domestic product, exports, or inflation).³⁹² *Second*, none of the sports economics literature reviewed in the

firm-level data on new patent awards, and finding that firms share approximately one third of the revenue generated by patents with their employees). *See also* Louis N. Christofides & Andrew J. Oswald, *Real Wage Determination and Rent-Sharing in Collective Bargaining Agreements*, 107(3) THE QUARTERLY JOURNAL OF ECONOMICS, 985-1002 (1992). (Presenting evidence that the collective bargaining strength of workers allows them to gain a greater share of firm rents). *See also* David Blanchflower, Andrew Oswald, & Peter Sanfey, *Wages, Profit, and Rent-Sharing*, 111(1) THE QUARTERLY JOURNAL OF ECONOMICS, 227-251 (1996). (Panel study on 200,000 full-time full-year workers in U.S. manufacturing firms from 1964-1985, finding that as firms become more profitable, wages rise over time, indicating that firms share rents with their employees). *See also* David Card, Francesco Devicienti, & Agata Maida, *Rent-sharing, Holdup, and Wages: Evidence from Matched Panel Data* 81(1) REVIEW OF ECONOMIC STUDIES 84-111 (2014) (Analyzing Social Security earnings records for workers linked to detailed financial data for their employers, and finding evidence that firm-level bargaining splits rents between employers and employees).

388. Oyer Report ¶31.

389. *Id.*

390. Autor, et al., *supra* at 181 (“We use data from the US economic census, conducted every five years to enumerate all establishments in select sectors on current economic activity. We focus on the economic census from 1982 to 2012 for six large sectors...For the six sectors, the census reports each *establishment’s annual payroll, output, employment, and an identifier for the firm to which the establishment belongs...* To implement our industry-level analysis, we assign each establishment in a given year to a 1987 SIC-based time-consistent industry code as described in Autor et al. (2017). Our methodology yields 676 industries, 388 of which are in manufacturing.”) (emphasis added).

391. As explained above, Professor David Autor of MIT, the lead author of Autor, et al., is a well-known labor economist, who has published a large number of articles on labor economics, including in the *Journal of Labor Economics*, which is edited by Dr. Oyer. *See* <https://economics.mit.edu/faculty/dautor/cv>.

392. Dobbelaere & Mairesse, *supra*, at 2 (discussing a “large panel of French manufacturing firms”).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

prior section consists of macroeconomic studies. *Third*, even the macroeconomic literature analyzes labor shares to draw inferences regarding market power, despite Dr. Oyer's claim to the contrary.³⁹³ For example, a paper titled "Declining Labor and Capital Shares" concludes that a "decline in the labor share is strongly associated with an increase in [firm] concentration," and that this is "consistent with a model in which firms face barriers to entry, where prices are the result of monopolistic competition."³⁹⁴ Similarly, a 2017 study concludes that rising market power explains the observed decline in the labor share in the U.S. economy.³⁹⁵ A 2013 paper observes that "the constancy of the share of income that flows to labor has been taken to be one of the quintessential stylized facts of macroeconomics,"³⁹⁶ but that in recent years "prominent measures of labor's share in the United States have declined significantly."³⁹⁷ That study considers de-unionization as one possible contributing factor in the global decline in the labor share, noting that "[t]he bargaining power of unions tends to increase workers' share of the surplus generated in the production process."³⁹⁸ In summary, Drs. Oyer, Topel, and Blair are incorrect to assert labor share is an irrelevant metric to study market power in labor economics specifically or in economics generally.

393. Oyer Report ¶31.

394. Simcha Barkai, "Declining Labor and Capital Shares," University of Chicago New Working Paper Series No. 2 (November 2016), *available at* <https://research.chicagobooth.edu/~media/5872fbeb104245909b8f0ae8a84486c9.pdf>, at 27 (emphasis added). The study "contributes to a large literature on the macroeconomic importance of profits and markups." *Id.* at 4. It uses data from the National Income and Productivity Accounts, and other data from the Bureau of Economic Analysis, the government agency that publishes data on Gross Domestic Product and other macroeconomic variables. *Id.* at 7 - 8.

395. Jan De Loecker & Jan Eeckhou, "The Rise of Market Power and the Macroeconomic Implications," NBER Working Paper No. 23687 (August 2017), *available at* <http://www.nber.org/papers/w23687>

396. Elsby et al. at 2.

397. *Id.* at 2.

398. *Id.* at 38 (citing Barry Hirsch, *Unions, Dynamism, and Economic Performance*, in MICHAEL WACHTER AND CYNTHIA ESTLUND, EDS., RESEARCH HANDBOOK ON THE ECONOMICS OF LABOR AND EMPLOYMENT LAW (Edward Elgar Series of Research Handbooks in Law and Economics 2012)). Elsby et al. find that "deunionization can explain 1.5 percentage points of the drop in the aggregate payroll share," although the result is not statistically significant and the evidence is therefore inconclusive. Elsby et al. 39.

3. Wage Shares, Not Levels, Are The Appropriate Dependent Variable For My Impact Regressions

108.

[REDACTED]

399.

400.

401.

402.

[REDACTED]

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

403. As explained in my initial report, the Event Revenue used in my regression analysis were calculated using Zuffa's P&L statements, and include Ticket Sales/Site Fees PPV/Broadcast Sales/Fees (including "Web Buys" and "Other"), event-specific Merchandise, and event-specific Sponsorships. Singer Report ¶181, n. 451.

404. Dr. Oyer incorrectly critiques me for analyzing as "the percentage of a firm's *total revenues* paid out as workers' compensation." Oyer Report ¶8 (emphasis added). Yet, as Dr. Oyer himself recognizes, my impact regression measures a Fighter's wage share not as a proportion of Zuffa's *total* revenue, but rather as the share of event-specific revenue paid to the Fighter in question. *Id.* ¶9.

405. Oyer Dep. at 67:11-14.

406. [REDACTED]

407. WME-ZUFFA-0001150, at 11. *See also* ZFL-2677898-7967, at 957 (Zuffa using "Athlete Costs" as a "% Rev", among other metrics, to evaluate fighter compensation).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

408.

410. Dr. Topel also admitted that none of the competitors that Zuffa acquired (WFA, WEC, Pride, Strikeforce) had been able to challenge Zuffa's market share in either the input or output markets. Topel Dep. at 370:25-371:13 ("A. It's been pretty stable over time"). Dr. Topel also admitted that at the time they were purchased, none of the promotions that Zuffa acquired presented a significant economic threat to the UFC. *Id.* at 372:22-373:13. Similarly, Dr. Topel claims in his report that none of the MMA promotions that Zuffa has acquired, including relatively prominent promotions such as Pride and Strikeforce, had any substantial market power or share. Topel Report ¶172.

411.

PUBLIC COPY - REDACTED

D. The So-Called “Corrected” Impact Regressions Submitted by Zuffa’s Economists Are Fatally Flawed

110. Both Dr. Topel and Dr. Oyer present regression models that use the level of Fighter compensation, rather than the Fighter Share, as the dependent variable.⁴¹² As explained below, these purported corrections are fatally flawed.

1. Zuffa’s Economists Assume Nonsensically That Event Revenue Is Unrelated to Fighter MRP, Fighter Compensation, or Both

111.

412. Topel Report Exhibit 13; Oyer Report Table 1. Both reports use the natural logarithm of Fighter compensation as the dependent variable.

413. Topel Report Exhibit 13, columns (1) – (3); Oyer Report Table 1.

414. Blair Sports Econ at 354. Dr. Topel admitted in his deposition that “if there’s monopsony power in the market, the athlete will get paid below his marginal revenue product.” Topel Dep. 46:4-10 (“Q. So if the market’s competitive, the athlete will get paid equal to his marginal revenue product; and if there’s monopsony power in the market, the athlete will get paid below his marginal revenue product, correct? A. Yeah. All athletes, not just Zuffa.”).

112. Zuffa's economists recognize elsewhere that their assumption that fighter compensation can be meaningfully evaluated without considering the substantial growth in Event Revenue over time cannot be correct. Dr. Oyer, for instance, concedes that "[h]aving good fighters" is one factor that would increase Zuffa's revenue.⁴¹⁵ In other words, he recognizes that Fighters contribute to revenue growth, thereby contradicting the premise of his regression model that divorces Fighter compensation from the revenues they generate. Dr. Oyer also acknowledges that plaintiffs' economic expert in *High-Tech Employee* controlled for employer revenue when analyzing the suppression of compensation among technical workers in Silicon Valley.⁴¹⁶ Similarly, Dr. Blair admits that the unique skills and other athlete attributes play an important role in the revenues generated by sports organizations, because the identify or performance of the individual workers is "a specific feature of the demand on the part of the fan base, or consumers ... that can influence how many people are willing to buy tickets to watch ... [a]nd how much they're willing to pay for those tickets."⁴¹⁷

113. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

415. Oyer Report ¶36. One of Dr. Oyer's critiques of my regression relies on plaintiffs' economists' regression in *High-Tech Employee*. As explained below, this critique is incorrect. See Part III.D.2, *infra*.

416. *Id.* ¶45.

417. Blair Dep. at 18:7-14, 20:15-19.

418. Topel Report ¶311.

419. Topel Dep. at 23:24-24:3 ("Q. So when Zuffa makes its fighters more effective revenue generators, they're able to generate more revenues when they fight; is that fair? A. Yes."); *id.* at 24:20-25:9 ("Q. Okay. So if what Zuffa does is makes it – makes its fighters more effective revenue generators, then what you were saying is that Zuffa in this example is causing the marginal revenue product of its fighters to increase, correct? A. Yes. Q And is it your opinion that Zuffa is particularly good at is causing its fighters to be more effective revenue generators? A. I think that's Zuffa's position and I think that's what the evidence tends to show, yes. Q. Is it your opinion? A. I just said yes.").

[REDACTED]

114.

[REDACTED]

420.

[REDACTED]

421. Topel Report Exhibit 13, columns (4) – (6).

422.

[REDACTED]

423. When a regression excludes a relevant variable, the resulting analysis is biased and inconsistent. Wooldridge at 89-94. *See also* Kevin Caves & Hal Singer, *Applied Econometrics: When Can an Omitted Variable Invalidate a Regression?* THE ANTITRUST SOURCE 1-9 (December 2017).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

2. Dr. Topel's Only Attempt to Incorporate Event Revenue in the Impact Regression Assumes Away the Effect of the Challenged Conduct and Is Econometrically Flawed

115. As noted above, alone among Zuffa's economists, Dr. Topel estimates regressions that attempt to control for growth in Event Revenue. In particular, he specifies regressions in which (1) the dependent variable is the level of Fighter Compensation *and* (2) Event Revenue is included as an explanatory (or independent) variable. Dr. Topel is correct that Event Revenue needs to be incorporated into the regression analysis. Fighter compensation is, as he concedes, related to the Event Revenue that the Fighters generate.⁴²⁵

116. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

424. [REDACTED]

425. Topel Dep. at 418:9-17.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

117. As to the first point, Dr. Topel's model assumes away the very hypothesis that my impact regressions are designed to test: By putting Event Revenue in the model as an explanatory variable, Dr. Topel's regressions attempt to measure the effect of Zuffa's foreclosure share on Fighter compensation, *holding Event Revenue constant*. That implicitly assumes that Zuffa's foreclosure has no effect on the proportion of Event Revenue paid to Fighters. Thus, Dr. Topel's regressions, by design, cannot test whether the Challenged Conduct permitted Zuffa to pay Fighters a smaller share of their MRP. In contrast, by using wage share as the independent variable, my regressions are able to test whether an increase in Zuffa's foreclosure share correlates to a decrease in Fighter compensation as a proportion of Event Revenue.

118. As to the second point, Dr. Topel's inclusion of Event Revenue as an explanatory (or independent) variable causes technical econometric problems. Both Event Revenue and Fighter compensation are simultaneously determined by Fighter MRP, which cannot be observed directly. In other words, when a Fighter's MRP increases—when, primarily, a fighter becomes more popular with paying audiences and therefore is capable of generating more revenue when he or she fights—the revenue from the events at which the Fighter competes will increase and so will the compensation the Fighter receives. In Dr. Topel's deposition, he admitted that an increase in Fighters' MRP could increase event revenue.⁴²⁶ He also acknowledged that both Fighter compensation and Event Revenue are positively related to the willingness to pay to watch MMA

426. *Id.*

fighters.⁴²⁷ He conceded further that using Event Revenue as an explanatory variable attempting to predict compensation—as he does in his own regression—introduces complicated questions of “causation.”⁴²⁸

119. In econometric terms, what this means is that Event Revenue is endogenous.⁴²⁹ In particular, because Fighter compensation and Event Revenue are jointly determined by Fighter MRP, Dr. Topel’s regressions suffer from a form of endogeneity known as “simultaneity bias.”⁴³⁰ When a regression suffers from simultaneity bias, the coefficients on both the endogenous variables in the model and the exogenous control variables are biased and inconsistent.⁴³¹ In other words, regressions that suffer from simultaneity bias, like Dr. Topel’s here, are unreliable. As acknowledged by Dr. Topel, an econometrician “can’t learn much from [a] regression” that is plagued by simultaneity bias.⁴³² Dr. Oyer also admitted that endogeneity bias invalidates regression estimates.⁴³³ In contrast, my own impact regression avoids this serious problem by estimating a “reduced form” model that includes Event Revenue as part of the dependent variable.⁴³⁴ Removing Event Revenue from the list of independent variables and reclassifying it as a dependent variable appropriately recognizes that Event Revenue is endogenously determined (caused) by the independent variables in the regression model.

427. *Id.* at 420:15-19.

428. *Id.* at 39:24-40:4.

429. Wooldridge at 88.

430. *Id.* at 546 (“Another important form of endogeneity of explanatory variables is simultaneity. This arises when one or more of the explanatory variables is jointly determined with the dependent variable.”). *See also id.* at 546-552.

431. *Id.* at 550-552.

432. Topel Dep. at 526:19-21.

433. Oyer Dep. at 157:14-17 (admits that in building a regression a statistician wants to avoid endogeneity problems); *see also id.* at 155:13-20 (recognizing that the independent variables in a regression must be “exogenous”—that is, free of endogeneity bias).

434. Wooldridge at 518.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

120. Dr. Oyer observes correctly that in *High-Tech Employee*, the plaintiffs' economist used a regression in which the dependent variable was employee compensation, and employer revenue was included as a control variable.⁴³⁵ Because I co-authored an article on *High-Tech Employee*, Dr. Oyer asserts that this is effectively a concession that my impact regression should be run using compensation levels and not wage share.⁴³⁶ Dr. Oyer is wrong. In *High-Tech Employee*, the Defendants were some of Silicon Valley's largest and most prominent companies, including Apple, Google, Intel, and Adobe.⁴³⁷ The total revenue earned by a corporation such as Apple is indeed plausibly exogenous to the amount of compensation received by an individual technical employee at Apple: In other words, an increase in the MRP of an individual technical employee would have no material effect on Apple's total corporate revenue. As a result, the plaintiffs' economist in *High-Tech Employee* was justified in including employer revenue as a control variable.⁴³⁸ In contrast, the revenue that Zuffa earns *at a particular event* is not independent of compensation paid to Fighters *at that event*. Both are determined by the MRP of the Fighters *at that event*. The more popular are the Fighters at an event, all things equal, the more revenue that event will generate and the more those Fighters will be paid. For that reason, a regression model that was appropriate in *High-Tech Employee* would not be appropriate in this litigation.

435. Oyer Report ¶45, citing Kevin Caves & Hal Singer, *Analyzing High-Tech Employee: The Dos and Don'ts of Proving (and Disproving) Classwide Antitrust Impact in Wage Suppression Cases*, 14(3) ANTITRUST SOURCE (2015), at 4 [hereafter, "Caves & Singer (2015)"].

436. *Id.* ("Dr. Singer holds up as an example of appropriate analysis a regression that uses employee compensation (log of compensation, I believe) as the dependent variable and employer revenue as a control variable rather than as the denominator of the dependent variable. But, when running the regressions in the current case, Dr. Singer chose to ignore this and to run the regressions with fighter share (rather than log of fighter pay) as the dependent variable.").

437. Caves & Singer (2015) at 1.

438. Conversely, using labor share as the dependent variable in plaintiffs' regression model in *High-Tech Employee* would not have made sense; the share of Apple's total corporate revenue paid to any individual technical employee is effectively zero.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

3. My Regression Model Continues to Show Impact and Damages Using Dr. Topel's Own "Stratified Foreclosure Shares"

121.

[REDACTED]

122.

[REDACTED]

E. Zuffa's Economists' Claims Regarding the "Win Flag" Variable and Other Control Variables Are Misleading and Incorrect

123.

[REDACTED]

439. Topel Report ¶¶165-166; *id.* at Exhibit 16.

440. *Id.* ¶166.

441. *See* Part II.B, *supra*.

442. *See* Appendix Table A2.

443. Oyer Report, Table 1.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

124. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

444. *Id.* ¶52.

445. Topel Report ¶149.

446. Fighter fixed effects control for all of a Fighter's individual-specific attributes that remain constant over time.

447. Wooldridge at 96-99.

448. [REDACTED]

125. [REDACTED]

[REDACTED]

126. [REDACTED]

[REDACTED]

449. Topel Report ¶149.

450. [REDACTED]

451. Offensive Passes measures the number of position improvements that a Fighter achieves during a bout. *Id.*

452. *Id.* Table 6.

453. Oyer Report Table 1; Topel Report Exhibit 13 (supporting work papers).

454. Singer Report Table 6.

455. Oyer Report Table 1; Topel Report Exhibit 13 (supporting work papers).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

127. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

F. Dr. Topel's Critiques of the Rank-Based and Revenue-Based Weighting Used in My Analysis Are Without Merit

128. My initial report explained that using unweighted Fighter counts to calculate Zuffa's market share and foreclosure share would make little economic sense, given that Fighters

456. See, e.g., Gene Grossman & Alan Krueger, *Economic Growth and the Environment* 110(2) QUARTERLY JOURNAL OF ECONOMICS (1995), 353-377, at 363 ("In view of the strong multicollinearity between current and lagged GDP, as well as among powers of GDP, it is difficult to infer much about the individual coefficients. However, in most cases the collection of current and lagged GDP terms is highly significant. It appears therefore that national income is an important determinant of local air and water pollution."). See also Kent Smetters, *Is the Social Security Trust Fund a Store of Value?* 94(2) AMERICAN ECONOMIC REVIEW PAPERS & PROCEEDINGS 176-181, 180 (2004) ("A larger GDP and larger 'wages and salaries' increase the on-budget surplus. (These two variables, however, are highly collinear and, therefore, only jointly significant.)").

457. Topel Report ¶146; Oyer Report ¶48.

458. See Appendix Table A3.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

vary in their ability to attract viewers, generate event revenues, and hence their value to an MMA promoter.⁴⁵⁹ The purpose of my foreclosure analysis is to assess the competitive effects of the growing share of the Relevant Input Market subject to Zuffa's exclusive contracts. Treating all Fighters as if they were equivalent, when in fact they are not, would give an inaccurate picture of the importance of the extent to which the Challenged Conduct has foreclosed Zuffa's rivals from a critical mass of top Fighters. My initial report uses two alternative weighting schemes to capture differences in the quality of Fighters across different MMA promoters. One is based on Fighters' relative rankings, and the other is based on their associated promoters' PPV and gate revenue.⁴⁶⁰ As explained below, Dr. Topel's critiques of these weighting methods are without merit. Moreover, the results of my impact regressions do not hinge on any particular weighting scheme; they are robust to using revenue-based weights, rank-based weights, or even unweighted Fighter counts.⁴⁶¹

1. Dr. Topel's Critiques of Rank-Based Weights Are Incorrect

129. My initial report shows that my impact regressions are robust to alternative weighting schemes, including when Fighters are weighted by the inverse of their rank.⁴⁶² MMA promoters rely on high-profile, highly-ranked Fighters at the Top of the Card to draw audiences to Live MMA Events,⁴⁶³ and Fighter rankings such as the *USA Today/MMA Junkie* rankings are published on fan websites and updated regularly.⁴⁶⁴ Rank-based weights account for the fact that

459. Singer Report ¶128.

460. *Id.* ¶¶128-129, 169.

461. *Id.* ¶182, n. 453.

462. In other words, the Fighter ranked first in his or her weight class receives twice the weight of the second-ranked Fighter; the fighter ranked third receives one third the weight of the first-ranked fighter, and so on. *Id.* ¶182, n. 453.

463. *Id.* ¶20; see also *id.* Part I.A.

464. See <http://mmajunkie.com/category/mma-rankings> (generally showing biweekly updates); see also <http://www.fightmatrix.com/faq/> ("We usually update every Sunday or Monday.").

the higher-ranked a Fighter is, the more valuable he or she is to a promotion, and thus the more economically significant it is when Zuffa locks him or her up to an exclusive contract. Dr. Topel claims that this weighting method is arbitrary.⁴⁶⁵ Dr. Topel bases this claim on: (1) a single example from a single bout;⁴⁶⁶ and (2) on the fact that, during the Class Period, approximately 10 percent of bouts matched a top-ranked Fighter against the second-ranked Fighter in that division.⁴⁶⁷ Dr. Topel is wrong: Neither (1) nor (2) invalidate rank-based weights. To the contrary, the data demonstrate that Fighter rankings, far from being arbitrary, are reliable indicators of Fighters' revenue-generating ability.

130. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

465. Topel Report ¶230.

466. *Id.* ¶229.

467. *Id.* ¶230. Dr. Topel claims that “[d]uring the Class Period, 90 percent of Zuffa’s events have featured an athlete at the top of the card...who was not ranked first or second in their respective division.” *Id.* Put differently, approximately 10 percent of bouts matched a top-ranked Fighter against the second-ranked Fighter. However, in 43 percent of these bouts, at least one of the Fighters at the top of the card was ranked first or second. And in 63 percent of these bouts, at least one of the Fighters at the top of the card was ranked in the top five of his or her division. More broadly, my initial report explains that Zuffa relies heavily on Headliners (Fighters ranked within the top 15 of their weight classes) to fill the Top of the Card. For example, in 129 of the 159 UFC PPV events from 2005 to May 2017, both of the Fighters at the Top of the Card were Headliners. At least one of the Fighters at the Top of the Card was a Headliner in 158 of these 159 events. *See Singer Report* ¶113.

468. Topel Report ¶229.

469. [REDACTED]

[REDACTED]

[REDACTED]

131. The relationship between Fighter rankings and event revenue has been recognized in published work. In a 2015 article published in the *Journal of Business and Economics*, Professors McGowan and Mahon estimate an econometric model analyzing the determinants of PPV buy rates for UFC events.⁴⁷⁰ When discussing the ways in which their empirical model could be improved upon in future work, the authors note that “[s]everal omitted variables exist that are ideally incorporated into the model, including the number of top 5 ranked fighters on the card....”⁴⁷¹

132. With respect to (2), Dr. Topel observes that “[d]uring the Class Period, 90 percent of Zuffa’s events have featured an athlete at the top of the card...who was not ranked first or second in their respective division.”⁴⁷² (Put differently, approximately 10 percent of bouts matched a top-ranked Fighter against the second-ranked Fighter). It is unclear why Dr. Topel believes that this statistic invalidates my rank-based weights, which (as explained above) are reliable predictors of Event Revenue and Fighter compensation. My rank-based weighting method does not assume or

470. McGowan & Mahon (2015).

471. *Id.* at 1047.

472. Topel Report ¶230.

predict that first-ranked and second-ranked Fighters should always appear at the Top of the Card. That would be the case only if rank were the *only* factor that MMA promoters considered when matching Fighters against one another. In any case, in 43 percent of the bouts during the Class Period, at least one of the Fighters at the top of the card was ranked first or second. And in 63 percent of these bouts, at least one of the Fighters at the top of the card was ranked in the top five of his or her division. More broadly, my initial report explains that Zuffa relies heavily on Headliners (Fighters ranked within the top 15 of their weight classes) to fill the Top of the Card. For example, in 129 of the 159 UFC PPV events from 2005 to May 2017, both of the Fighters at the Top of the Card were Headliners. *And at least one of the Fighters at the Top of the Card was a Headliner in 158 of these 159 events.*⁴⁷³

2. Dr. Topel's Critiques of Revenue-Based Weights Are Incorrect

133. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

473. Singer Report ¶113.

474. *Id.* ¶¶128-129, 169. My initial report explained that this approach is conservative because revenue data are available only for (relatively) large non-Zuffa MMA promotions such as Bellator and Strikeforce, so that Fighters from smaller promotions (which lack such data) receive the same weight as if they were affiliated with a larger promotion. *Id.* ¶128, n. 350.

475. Topel Report ¶220.

476. *Id.* ¶221.

477. *Id.*

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

134. These examples reflect a distortion of my method and thus have no relevance. Dr. Topel is wrongly assuming that my revenue weights must be somehow tailored to individual Fighters. As explained in my initial report, my revenue weights are specific to MMA promoters, not to individual Fighters: “Fighters in the Relevant Input Market were weighted by their *associated promoters’* PPV and gate revenues per Fighter, to reflect differences in the *average* quality of Fighters across *different MMA promoters*.”⁴⁸⁰ For purposes of calculating Zuffa’s foreclosure share, the relative weightings of individual Fighters are mathematically irrelevant; what matters is how Zuffa fighters are *collectively* weighted relative to non-Zuffa Fighters.

135. To see this, assume that the average PPV and gate revenue per Zuffa Fighter is \$100, and that the average PPV and gate revenue per non-Zuffa Fighter is \$50. Suppose further that there are a total of 20 Zuffa Fighters, all of which are subject to long-term exclusive contracts, and that there are a total of ten non-Zuffa Fighters. Under this hypothetical, Zuffa’s revenue-weighted foreclosure share is equal to $\$100 * 20 / [\$100 * 20 + \$50 * 10] = 0.80$. This calculation weights all Zuffa fighters equally, based on the average across all Zuffa Fighters. But what if some Zuffa fighters are worth more than others? For example, suppose that half of Zuffa fighters have average PPV and gate revenues of \$150 per Fighter, while the other half have average PPV and gate revenues of just \$50 per Fighter. In principle, one could weight half of Zuffa’s fighters more and the other half less, but mathematically it would make no difference—the percentage of the

478. *Id.* ¶222.

479. *Id.* ¶223.

480. Singer Report ¶128 (emphasis added).

overall market foreclosed by Zuffa would be the same. To see this, note that Zuffa's foreclosure share if the two groups of Zuffa Fighters are weighted separately would be $[\$150*10 + \$50*10] / [\$150*10 + \$50*10 + \$50*10] = 0.80$. This is mathematically equivalent to the prior calculation. Reshuffling Zuffa's revenue weights to account for differences in individual Fighters' "ability or marketability"⁴⁸¹ has no effect on Zuffa's foreclosure share. Indeed, my revenue weights are agnostic as to these individual differences because all that matters for my foreclosure calculation is the share of the total market foreclosed by Zuffa, not how much any individual Fighter contributes to that foreclosure.

136. Dr. Topel also claims that my revenue-based weights "do not account for differences in promoters' revenues that are attributable to factors unrelated to athletes."⁴⁸² According to Dr. Topel,

For an athlete of fixed talent, a promoter that invests more in marketing or is better at marketing than other promoters will have a higher return, as measured by event revenue. Then differences in event revenue across promoters are determined by differences in promoters' investments and business acumen.⁴⁸³

Dr. Topel fails to explain how differences in event revenue across different MMA promoters could be the result of factors completely unrelated to Fighters. If, as Dr. Topel claims, Zuffa's investments make its Fighters "more effective revenue-generators,"⁴⁸⁴ then, by definition, Zuffa's investments also increase Fighters' MRP, as Dr. Topel admitted.⁴⁸⁵ But this observation hardly means that the resulting increase in Event Revenue is unrelated to Fighters. It therefore remains

481. Topel Report ¶220.

482. *Id.* ¶224.

483. *Id.*

484. *Id.* ¶311.

485. Topel Dep. at 24:20-25:9 ("Q. Okay. So if what Zuffa does is . . . makes its fighters more effective revenue generators, then what you were saying is that Zuffa in this example is causing the marginal revenue product of its fighters to increase, correct? A. Yes. Q. And is it your opinion that Zuffa is particularly good at causing its fighters to be more effective revenue generators? A. I think that's Zuffa's position and I think that's what the evidence tends to show, yes. Q. Is it your opinion? A. I just said yes.").

appropriate to use revenue weights to account for differences in the quality—specifically, the revenue-generating ability—of Fighters across different promotions. If differences in promoters’ revenue weights were the result of procompetitive conduct, as Dr. Topel claims, then my impact regressions would not have found that the Challenged Conduct reduced the share of Event Revenue accruing to Zuffa’s Fighters, because an increase in Zuffa’s foreclosure share would not reflect the exercise of monopsony power. Further, if Dr. Topel’s claims were correct, my regressions would not continue to show impact and damages when revenue weights are not used to calculate Zuffa’s foreclosure share. But my impact regressions are robust to using revenue-based weights, rank-based weights, or even unweighted Fighter counts.⁴⁸⁶

137. Although he does not dispute my definition of the Relevant Output Market, or my conclusion that Zuffa has a dominant share in that market, Dr. Topel does claim, without citation to any authority, that my “revenue-weighted input shares imply that firms with significant market power in the output market also have a large share of the input market,”⁴⁸⁷ and that this conclusion is “not accepted by the economic literature.”⁴⁸⁸ This is a straw-man critique: My initial report does not claim that *every* firm with significant market power necessarily enjoys large shares in the markets where the firm purchases its inputs. For example, Zuffa has a dominant share of the Relevant Output Market, and also purchases office supplies as inputs. But that does not imply that Zuffa enjoys monopsony power in the market for office supplies: Zuffa’s dominance in the Relevant Output Market does not confer monopsony power in the market for paperclips. In contrast, the source of Zuffa’s dominance in the Relevant Output Market—its unique access to a broad stable of high-quality MMA Fighters, which is essential to staging successful Live MMA

486. Singer Report ¶182, n. 453.

487. Topel Report ¶227.

488. *Id.*

Events⁴⁸⁹—*does* imply that Zuffa also enjoys dominant shares in the Relevant Input Markets and Submarket. To illustrate, an MMA promoter that is a pure monopolist in the market for promoting MMA events is, by definition, a monopsonist in the market for Fighters seeking to be paid to appear in MMA events: If there is only a single dominant MMA promoter, then there is only one place for an MMA fighter to work. In his deposition, Dr. Topel admitted that a monopoly provider of MMA promotions would also be a monopsonist in the input market for MMA Fighters.⁴⁹⁰ Accordingly, to the extent that by using revenue weighting in my foreclosure analysis I am, in part, measuring the degree to which Zuffa's share of MMA Event Revenue (relative to the Event Revenue accruing to other MMA promotions) is growing over time, it is still an effective means of judging how Zuffa's growing share of all MMA Event Revenue (and thus growing monopoly power in the output market) has led to reduced Fighter compensation as a share of Zuffa's Event Revenue.

G. Dr. Topel's Claim That My Impact Regression Results Are Driven By "Mechanical" Relationships Is Incorrect

138. [REDACTED]

489. Singer Report ¶¶156-166.

490. Topel Dep. at 464:2-14.

491. [REDACTED]

492. Singer Report ¶¶180-187.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1. Dr. Topel’s Ad-Hoc Economic Model Fails to Prove a “Mechanical Negative Correlation Between Foreclosure and Compensation”

139. As proof for his claim that there is a “mechanical” negative relationship between Fighter Share and Zuffa’s foreclosure share, and that this relationship is merely “an implication of successful competition on the merits by Zuffa,”⁴⁹⁴ Dr. Topel offers an inapplicable, ad-hoc economic model.⁴⁹⁵ Dr. Topel makes no attempt to fit his model to any real-world data or provide any other evidence of its empirical relevance to MMA generally or this case specifically. Therefore, Dr. Topel’s model is simply a set of assumptions divorced from reality. Based on his model, Dr. Topel concludes that “Dr. Singer’s finding of a negative relationship between compensation as a share of revenue...and the share of MMA athletes under contract with Zuffa...is exactly what would occur if Zuffa’s success is the result of competing on the merits[.]”⁴⁹⁶ Dr. Topel is wrong.

493. Topel Report ¶27. Dr. Topel does not cite to any authority explaining what a “mechanical” relationship is, or the circumstances under which it is a valid econometric critique.

494. *Id.* ¶137.

495. *Id.* ¶¶308-315 (Appendix A).

496. *Id.* ¶315.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

140. Dr. Topel's economic model is predicated on extreme and inapplicable assumptions, and generates nonsensical results. *First*, Dr. Topel's economic model unrealistically assumes an effectively limitless supply of perfectly interchangeable Fighters: In economic terms, he assumes that Zuffa faces a "horizontal," or "perfectly elastic" labor supply curve.⁴⁹⁷ Thus, according to Dr. Topel's model, Zuffa can hire as many perfectly interchangeable Fighters as it requires at a flat rate, as if it were purchasing a homogenous commodity, such as paperclips: A perfectly elastic supply curve means that Zuffa has no control whatsoever over the market wage for Fighters; it is equivalent to assuming that Zuffa has *no monopsony power whatsoever*.⁴⁹⁸ The assumption of a horizontal supply curve is inapplicable to MMA Fighters, which are not commodities, but highly trained athletes, with widely varying attributes, skill levels, and revenue-generating potential.⁴⁹⁹

497. *Id.* ¶312.

498. *See, e.g.*, THOMAS HYCLAK, GERAINT JOHNES, AND ROBERT THORNTON, FUNDAMENTALS OF LABOR ECONOMICS 211 (Cengage 2nd ed. 2012) ("In a competitive labor market, each employer employs a small percentage of the total number of workers in that market. Individual employers are too small to have any effect on the wage rate, and every employer can hire as much labor as he or she desires without having to pay a higher wage. The supply of labor facing each employer in such a labor market is horizontal, or perfectly elastic. Certainly this description does not characterize all labor markets. In some labor markets, one employer employs a relatively large proportion of that market's total labor force, or maybe the labor market is dominated by more than one employer, but still a small number. In such cases employers may have some control over the wage they must pay to attract workers, in effect facing an upward-sloping supply of labor function, which is unlike that faced by competitive employers. These are monopsony employers... we are talking about a market with sufficiently few employers so that each of them has some control over the market wage and does not, therefore, face a perfectly elastic labor supply schedule."). *See also* Oyer Dep. at 62:12-64:21, 66:18-25.

499. Dr. Oyer admitted in his deposition that the supply curve of labor faced by Zuffa is not flat because Fighters are not perfect substitutes. Oyer Dep. at 83:5-15. *See also* Blair Dep. at 18:7-14 ("Is it fair to say that the unique set of skills that athletes have or their fame plays an important role in the revenues generated by sports organizations? A. Yeah, sure. I mean ... because of fan appeal The fans are more willing to pay to watch some of these so-called superstars."); Topel Dep. at 450:8-11 ("Q. All right. Would you agree with me that not all fighters are exact substitutes for each other? A. I'll agree with that."); *see also id.* at 432:10-24 ("Q. All things equal, consumers will be willing to pay more to see highly-ranked opponents fight than lower-ranked opponents fight; is that fair? A. In every instance, no, but on average, probably yes. Q. Higher ranked fighters, all things equal, generate more revenues when they fight than lower-ranked fighters, correct? ... A. Not always, but on average that's probably true."); *id.* at 450:12-19 ("Q. Would you agree with me that some fighters are more important to an MMA promotion than others? ... A. Yes. Q. Some [fighters] generate more revenues when they fight than others; is that right? A. Yes.").

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

141. *Second*, Dr. Topel's model engineers the result that Fighter compensation will never increase, regardless of how much additional revenue Zuffa earns from Fighters. This result is another consequence of Dr. Topel's patently unrealistic horizontal supply curve: Under Dr. Topel's model, as the UFC becomes more popular, its demand for Fighters increases. But no matter how popular the UFC becomes, there is no upward pressure on Fighter compensation. Again, Fighters are like paperclips: Zuffa can purchase as many paperclips as it needs at the market price. No matter how popular the UFC becomes, no matter how much Zuffa's operations expand, and no matter how much Zuffa's office-supply purchases increase, it will not cause the price of a paperclip to rise at all. By the same logic, under Dr. Topel's model, Fighters never get a raise, no matter how much revenue they generate for Zuffa. But—according to Dr. Topel—this would not reflect the exercise of monopsony power, and instead is indicative of competition.⁵⁰⁰

142. *Third*, Dr. Topel's economic model cannot explain why Zuffa would enter into long-term exclusive contracts with Fighters. If Fighters really were a uniform commodity, as Dr. Topel's model assumes, Zuffa would have no need for long-term contracts of any kind, because any Fighter that left Zuffa could immediately be replaced by another identical Fighter at exactly the same compensation as the previous Fighter. Thus, Zuffa's own contracting practices invalidate Dr. Topel's model.

143. [REDACTED]

[REDACTED]

[REDACTED]

500. Topel Report Appendix A.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

2. Dr. Topel Fails to Prove that my Revenue-Based Weights Introduce a “Mechanical Negative Correlation Between Foreclosure and Compensation”

144. Dr. Topel also claims incorrectly that using revenue weights introduces a “mechanical negative correlation” into my impact regressions.⁵⁰⁵ According to Dr. Topel, as Zuffa’s revenue increases, this will (1) cause Fighter compensation as a share of revenue to decline; while, (2) simultaneously causing Zuffa’s revenue-weighted foreclosure share to increase.⁵⁰⁶ Both (1) and (2) are incorrect.

145. With respect to (1), an increase in Zuffa’s Event Revenue indicates that Fighter MRP has increased. Holding other factors constant (as my impact regressions do), an increase in

501. [REDACTED]

502. Topel Report ¶200

503. See Topel Dep. at 39:10-23, 201:19-202:11, 202:21-203:3, 420:10-19.

504. See, e.g., Damon Martin, *Dana White defends fighter pay: ‘In this sport you eat what you kill’*, FOX Sports, November 15, 2016, at <https://www.foxsports.com/ufc/story/dana-white-defends-fighter-pay-in-this-sport-you-eat-what-you-kill-092616> (“When you fight on pay-per-view and you’re a star — basically in this sport you eat what you kill. So the guys that bring in the majority of the revenue, make the majority of the revenue.”). See also Mike Bohn, *UFC President Dana White: If you’re not a ‘big pay-per-view star, shut up and fight’*, MMAJunkie, March 4, 2017, at <http://mmajunkie.com/2017/03/ufc-president-dana-white-if-youre-not-a-big-pay-per-view-star-shut-up-and-fight> (Dana White says: “Guys are talking about money fights, and I’m like, ‘You’re not a money fight... OK? You’re going to make whatever you’re going to make, and if you’re a good champion, your fight sells, and you’re going to do pay-per-views and be part of the pay-per-view. If you’re not that big pay-per-view star, shut up and fight.’”).

505. Topel Report ¶¶163-166; *id.* at Exhibits 15-16.

506. *Id.*

Zuffa's Event Revenue should not cause Fighter compensation as a share of revenue to decline—unless Zuffa is exploiting its monopsony power to pay Fighters a smaller share of their MRP.

146. With respect to (2), Zuffa's revenue-weighted foreclosure share will increase only if Zuffa's average gate and PPV revenue per Fighter increases *relative to that of other MMA promoters*, indicating that Fighters under contract with Zuffa have become more valuable, relative to non-Zuffa Fighters. Again, the impact regression will measure a correlation between this increase in Zuffa's foreclosure share and a decrease in the Fighter Share *if and only if*, after controlling for all other factors in the regression, Zuffa pays Fighters a lower share of Event Revenue when Event Revenue increases—that is, only if the data indicate that Zuffa is exercising monopsony power by paying Fighters a lower fraction of their MRP. In his deposition, Dr. Topel reversed himself and effectively admitted that there was not a mechanical relationship between my revenue-weighted foreclosure share and wage share.⁵⁰⁷

147. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

507. Topel Dep. at 462:6-12 (acknowledging that an increase in Zuffa revenues do not automatically cause Zuffa's foreclosure share to increase).

148. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

III. ZUFFA'S ECONOMISTS IN NO WAY UNDERMINE MY CLASSWIDE PROOFS OF COMMON IMPACT ON THE BOUT AND IDENTITY CLASSES

149. My initial report shows that common impact can be demonstrated for both the Bout Class⁵¹² and the Identity Class⁵¹³—with classwide evidence and analyses. As explained below, Zuffa's economists' critiques of my classwide proofs of impact are without merit.

508. See Appendix Table A4.

509. Topel Report ¶¶163-166.

510. Singer Report ¶182, n. 435. My regression results are also robust to calculating Zuffa's foreclosure share by weighting Fighters by the inverse of their rank. *Id.*

511. Topel Report ¶225.

512. Singer Report Part IV.

513. *Id.* Part V.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

A. Zuffa’s Economists Fail to Rebut My Classwide Econometric Proof That the Vast Majority of Bout Class Members Suffered Impact

150. [REDACTED]

[REDACTED]

151. Dr. Topel claims incorrectly that my regression models are “not designed to measure whether each Bout class member suffered damages.”⁵¹⁸ But this is precisely what my second method for proving antitrust *impact* does, as explained immediately above. Dr. Topel appears to be confusing my calculations of aggregate damages—which, as Dr. Topel suggests, “calculate the average underpayment [to Fighters]...and appl[y] that underpayment to an estimate of total event revenue during the Class Period”⁵¹⁹—with my econometric method for proving

514. See, e.g., *In re Air Cargo Shipping Servs. Antitrust Litig.*, No. 06-MD-1775 JG VVP, 2014 WL 7882100 (E.D.N.Y. Oct. 15, 2014).

515. Singer Report ¶¶230-231.

516. *Id.* ¶230.

517. *Id.* Table 8 (corrected figures reported in Singer Errata).

518. Topel Report ¶279.

519. *Id.* ¶279; see also Singer Report Part VI (“Aggregate Damages”).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

antitrust impact, which relies on individual, class-member specific predictions from my regression model.⁵²⁰

152. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

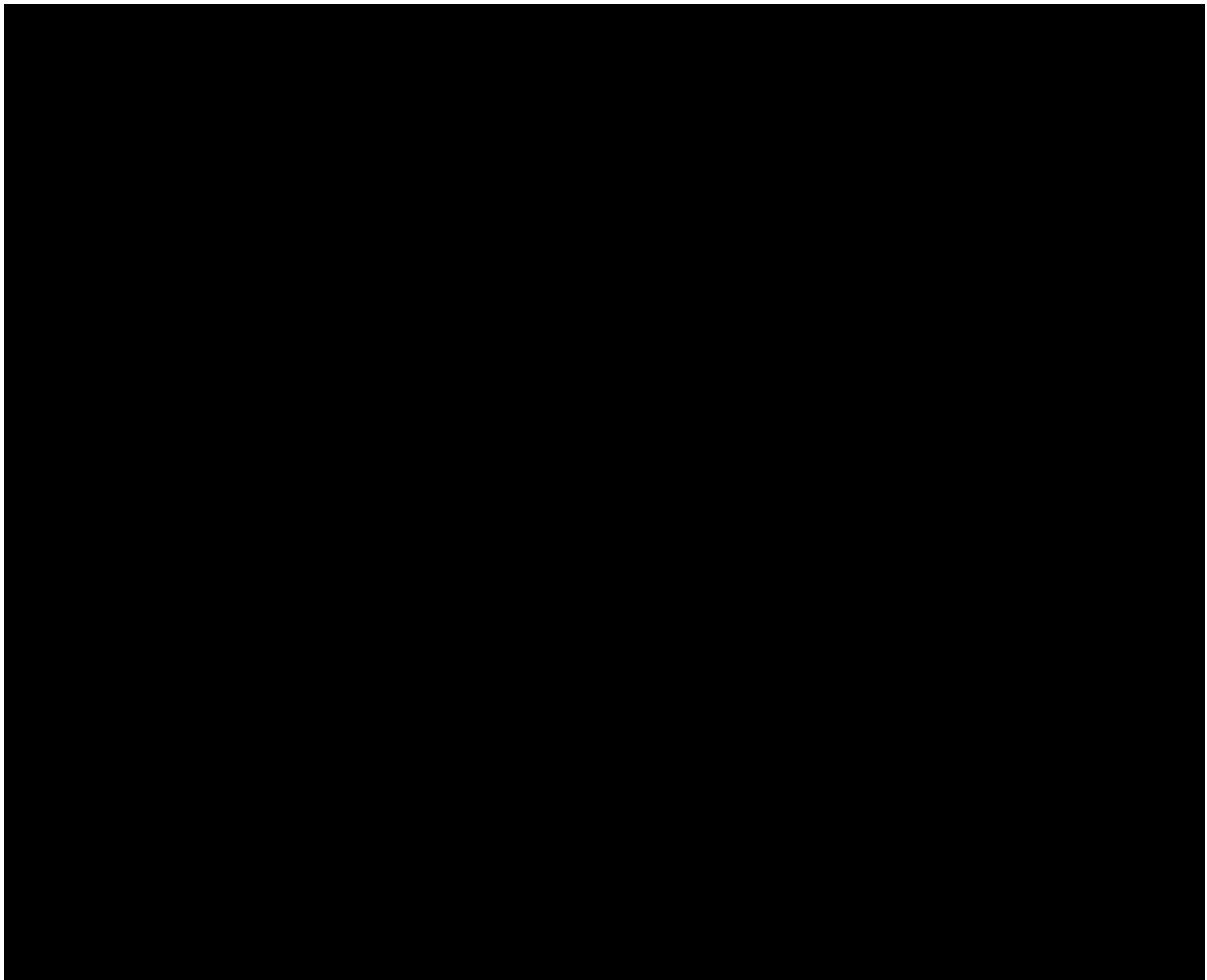
[REDACTED]

[REDACTED]

520. Singer Report ¶¶230-231.

521. Topel Report ¶280, n. 405.

522. [REDACTED]



B. Zuffa's Economists' Critiques of My Compensation Structure Analyses of Common Impact Are Without Merit

153. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

523. Singer Report Parts IV.A-IV.B; *id.* at Part V.

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1. Dr. Topel Misunderstands the Meaning of Compensation Structure in the Class Certification Context

154. My initial report explained that my compensation structure methodology had been accepted in prior antitrust litigation.⁵²⁷ Dr. Topel dismisses the entire methodology as [REDACTED]⁵²⁸ claiming [REDACTED]

[REDACTED]

[REDACTED] Dr. Topel appears not to understand the meaning of a compensation

524. *Id.* Parts III.D.1-2; *see also* Part I.B.1, *supra*.

525. Singer Report Part IV.B.1.

526. *Id.* Part IV.B.2.

527. *Id.* *See also* Order Granting Plaintiffs' Supplemental Motion for Class Certification, *High-Tech Employee Antitrust Litig.*, No. 11-CV-02509 (N.D. Cal. Oct. 24, 2013), at 60-61; Caves & Singer (2015) at 5.

528. Topel Report ¶266.

529. *Id.*

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

structure as it applies in the class certification context.⁵³⁰ As explained in my initial report, a compensation structure is simply “a mechanism that would transmit the artificially reduced compensation...broadly across the Class.”⁵³¹ To use Dr. Topel’s analogy, to the extent that the compensation of individual economists moves together with the average pay of other economists, an exercise of monopsony power that artificially suppressed economists’ compensation on average would be broadly transmitted across a hypothetical class of economists. In his deposition, Dr. Topel agreed that he would expect his pay as a consulting economist to move together with the pay of other consulting economists, because their compensation, while not identical, is determined by common factors.⁵³² *That is indeed evidence of a compensation structure.*

2. Zuffa’s Economists’ Critiques of the Compensation Structure Evidence Are Without Merit

155. [REDACTED]

[REDACTED]

530. See Topel Dep. at 176:23-177:6 (“A. Well, Dr. Singer seems to be referring to a – almost a schedule, a formulaic way of determining the pay of people ...”).

531. Singer Report ¶209.

532. Topel Dep. at 177:24-178:7 (“Q. And let’s talk about your economist example. Is the reason why the compensation of an individual economist . . . would be related to the compensation of average economists that there are similar factors that are at work in the compensation of economists in a market generally. A. There are common market forces.”). See also *id.* at 178:25-179:21 (“Q. ... You agree that your pay as a consulting economist tends to move generally with the average pay of all consulting economists, right? ... A. ... Economic principles tell[] me that should be true. Q. And thus even though different testimonial economists charge different rates based on various factors like experience and credentials, the pay of consulting economists tends to move together, right? ... A. I believe that would be true. Q. And that’s because there are certain common factors influencing the demand for testimonial economist services, correct? A. Or the supply.”); *id.* at 182:21-183:4 (“Q. ... Why would you expect that the earnings of individuals working in the same profession or for the same employer to be correlated? A. Well, for the same . . . profession, it’s back to my taco example that the market conditions affecting taco stands are common. So changes in the prices of corn to produce the tortillas and changes in the price of avocados affect all the taco stands.”).

533. Singer Report ¶¶216-226.

534. Topel Report ¶¶261-263; Singer Report ¶¶220-222.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

156. [REDACTED]

[REDACTED]

535. Topel Report ¶¶262.

536. Singer Report ¶222.

537. [REDACTED]

538. [REDACTED]

539. Topel Report ¶264.

540. *Id.* ¶¶264-65.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

157.

[REDACTED]

-
541. *Id.* ¶264 (citing Deposition of Ike Lawrence Epstein (December 2, 2016) at 29-32).
542. *Id.*
543. *Id.*
544. *Id.*
545. Singer Report ¶227.
546. Blair Report ¶79.
547. *Id.* Table 4.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

3. Dr. Topel's Critiques of My Compensation Structure Regressions Are Without Merit

158. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

159. [REDACTED]

[REDACTED]

[REDACTED]

548. Blair Dep. at 358:1-13.

549. [REDACTED]

550. Singer Report ¶228.

551. *Id.* ¶229.

552. Topel Report ¶¶269-270; *id.* Exhibit 32.

[REDACTED]

160.

[REDACTED]

553. *Id.* Exhibit 32, column (3).

554. *Id.*

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

161. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

162. [REDACTED]

[REDACTED]

[REDACTED]

555. *Id.* ¶270.

556. Singer Report ¶¶228-229; *id.* Table 7.

557. *Id.*

558. Topel Report ¶268.

559. *See* Part II.B, *supra*.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

163. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

560. ROBERT PINDYCK & DANIEL RUBINFELD, 117-119 ECONOMETRIC MODELS & ECONOMIC FORECASTS (McGraw-Hill 3rd ed. 1991).

561. As explained above, Fighter fixed effects control for all of a Fighter's individual-specific attributes that remain constant over time.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

164. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

562. Singer Report ¶227.
563. Topel Report ¶272.
564. Wooldridge at 80-81.
565. Topel Report ¶272.
566. *Id.*

[REDACTED]

4. Dr. Topel Presents Classwide Evidence Consistent with, and Reinforcing the Presence of, a Compensation Structure

165. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

567. Wooldridge at 80-81.

568. Topel Report ¶¶170-171; *id.* Exhibit 17.

569. *Id.* ¶171.

570. Topel Dep. at 169:19-23 (conceding that the reason for the increase in Zuffa fighter compensation in all ranking categories was “an increase in interest and demand for the services of MMA fighters generally”).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

C. Zuffa's Economists Fail to Rebut My Conclusions Regarding Internal Equity

166. [REDACTED]

D. Zuffa's Economists Fail to Undermine My Proof of Common Impact on the Identity Class

167. [REDACTED]

571. [REDACTED]

572. Singer Report ¶¶213-215.

573. Topel Dep. at 176:9-12 (acknowledging that he does not address the concept of internal equity in his report).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

168. My initial report used my impact regressions for the Bout Class to estimate the effect of the Challenged Conduct on Identity Subgroup One.⁵⁷⁵ Dr. Topel criticizes my proof of impact for Subgroup One of the Identity Class because it relies on my impact regressions.⁵⁷⁶ As explained above, Dr. Topel's critiques of my impact regressions for the Bout Class are without merit.⁵⁷⁷ Accordingly, Dr. Topel's claims with respect to Subgroup One of the Identity Class are also without merit.

169. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

574. Singer Report Part V.

575. *Id.* ¶237.

576. Topel Report ¶273.

577. *See* Part II, *supra*.

578. Singer Report ¶238.

579. *Id.* ¶¶239-240.

580. Topel Report ¶274.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

170. [REDACTED]

[REDACTED]

IV. ZUFFA’S ECONOMISTS IN NO WAY UNDERMINE MY AGGREGATE DAMAGES CALCULATIONS OR MY EVALUATION OF THE BUT-FOR WORLD

171. [REDACTED]

[REDACTED]

581. Singer Report ¶239.

582. *Id.* ¶240.

583. Topel Report ¶275.

584. [REDACTED]

585. Singer Report ¶¶245-256.

172. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

A. Aggregate Damages to the Bout Class

173. As explained below, Zuffa's economists' critiques of my aggregate damages calculations for the Bout Class are without merit, as are their critiques of my construction of the but-for world.

1. The Impact Regression Benchmark Is Sound and Reasonable

174. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

586. Topel Report ¶30.

587. *Id.*

588. Singer Report ¶¶251-252.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

2. The Zuffa Foreclosure Regression Benchmark Is Sound and Reasonable

175. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

-
589. These fixed effects control for all of a Fighter's individual-specific attributes that remain constant over time.
590. Singer Report Part III.D.1.
591. Singer Report ¶¶251-252; *id.* Table 11.
592. *Id.* ¶249.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED].

3. The Strikeforce and Bellator Benchmarks Are Sound and Reasonable

176. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

177. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

593. *Id.* ¶¶249-250; *id.* Table 10.

594. *Id.* ¶247. Due to limitations in the Strikeforce and Bellator data, I conservatively compare the share of total revenue that Strikeforce and Bellator paid to their Fighters, respectively, to the share of Event Revenue that Zuffa paid to its Fighters. *Id.* n. 576.

595. Blair Report ¶74.

596. Katz & Rosen at 283-284.

[REDACTED]

178. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

179. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

597. ZFL-1472338.

598. *Id.*

599. *Id.*

600. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

180.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

181. Dr. Topel does not reject the use of Strikeforce and Bellator as benchmarks. In fact, *he agrees* that both are [REDACTED]⁶⁰⁶ Dr. Topel simply repeats his argument that instead of using wage share (as I do), the level of compensation paid by

601. ZFL-1472338.

602. *Id.*

603. SBPCL00002101.

604. *Id.*

605. *Id.*

606. Topel Report ¶287. *See also* Topel Dep. at 59:15-21 (“So you’d need some kind of controlled experiment about how a firm in similar circumstances employed people and paid people or maybe in some market identifiably similar circumstances where arguably the existence of that market power you refer to did not exist or existed at some lower level.”); Blair Dep. at 335:23-336:10 (“[I]t’s important to think in terms of, you know, are these entities comparable in a variety of things? You know, are they offering, you know, the same product? Do they have the same quality management? You know, are they engaged in the same sort of promotion? You know, to the extent that the goods or services being produced by the yardstick are different, you know, are they similar enough so that, again – you know, the purpose of the yardstick is – analysis is to draw an inference about the plaintiff based on the performance of the yardstick. And so you want them to be very comparable.”); *id.* at 334:9-19 (“same industry”).

these other MMA promoters should be used.⁶⁰⁷ But as I explained in my initial report, the Challenged Conduct suppressed the revenues and profitability of other MMA promoters, by blocking access to a deep pool of talented Fighters, a critical input necessary for a successful MMA promotion.⁶⁰⁸ Because the Challenged Conduct suppressed the level of compensation paid by other MMA promoters (along with their revenues), compensation *levels* at these firms are not an appropriate competitive benchmark. In contrast, the *share* of event revenue paid to Fighters is a valid competitive benchmark, reflecting the share of MRP that Fighters would receive in the absence of the Challenged Conduct.⁶⁰⁹ Indeed, my initial report performed a standard statistical test indicting that the share of Event Revenue paid to Strikeforce Fighters was unaffected by Zuffa's foreclosure share, and therefore untainted by the Challenged Conduct.⁶¹⁰

182. If Dr. Topel were correct in claiming that compensation *levels* paid by Strikeforce and Bellator are the appropriate benchmarks, then application of Dr. Topel's benchmark would lead to the economically nonsensical conclusion that Zuffa consistently paid its Fighters *above* the competitive level. As Dr. Topel admits: [REDACTED]

[REDACTED]⁶¹¹ Dr. Topel provides no justification for his result that a profit-maximizing entity such as Zuffa would voluntarily pay

607. Topel Report ¶¶286-288.

608. Singer Report ¶¶156-166.

609. *Id.* ¶183, n. 454 ("although the Challenged Conduct, by reducing revenue opportunities for rival promoters, might have suppressed the *level* of compensation that Strikeforce (and other would-be rivals) could afford to pay to Fighters, the *share* of revenue paid to Fighters by Strikeforce remains an economically relevant benchmark for estimating but-for compensation") (emphasis in original). Another reason that I analyzed compensation shares is that including compensation as an explanatory variable in the model results in simultaneity bias. *See* Part II.D.2, *supra*.

610. Singer Report ¶183, n. 454 (explaining that "my regression analysis confirms that Zuffa's foreclosure (before the Class Period) did *not* significantly affect the Fighter Shares of pre-acquisition Strikeforce Fighters."). According to Dr. Oyer, entities with greater revenues "may pay a higher share of their revenue to athletes" than smaller-scale entities with less revenue, because smaller-scale entities "may be subject to much higher administrative costs as a percentage of revenue." *See* Oyer Dep. 171:4-11; Oyer Report ¶58. This implies that the share of revenue that Strikeforce paid its Fighters is a conservative benchmark for the share of revenue that Zuffa would have paid its Fighters under more competitive conditions.

611. Topel Report ¶287 (emphasis added).

substantially above-market compensation to its Fighters. Dr. Topel's result violates basic economic principles, according to which profit-maximizing firms minimize their costs.⁶¹²

B. Aggregate Damages to the Identity Class

183. As explained above, my initial report analyzed two subgroups of the Identity Class. The first, Identity Subgroup One, consists of those who received at least some sponsorship payments, video game payments, merchandise royalty payments, or athlete outfitting policy payments from Zuffa during the Class Period, according to Zuffa's records. The second, Identity Subgroup Two, consists of all Fighters who executed a PAR during the Class Period, regardless of whether these Fighters received compensation for use of their Identity in the actual world according to the JD Edwards or Merchandise Royalty Accrual database.⁶¹³

184. [REDACTED]

185. [REDACTED]

612. Katz & Rosen at 259; *id.* Chapter 9.

613. Singer Report ¶233.

614. *Id.* ¶¶253-254.

615. *Id.* ¶255.

186. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

C. Dr. Topel's Critiques of My Construction of the But-For World Are Without Merit

187. As explained below, Dr. Topel's critique that I fail to define the but-for world with sufficient specificity is misguided. Nevertheless, below I elaborate on my view of Zuffa's plausible contracting arrangements in the but-for world. I also explain why the most plausible damages estimate is the \$1.6 billion calculation that flows from my impact regression.

616. Topel Report ¶291.

617. Singer Report ¶238.

618. *Id.* [REDACTED]

1. A Plausible But-For World Would Include Substantially Shorter Fighter Contracts, and Substantially Fewer Restrictions on Fighter Mobility

188. Dr. Topel claims that my initial report fails to [REDACTED] [REDACTED]⁶¹⁹ because my initial report purportedly does not set out with sufficient specificity what the contracting arrangements, among other details, would look like in the but-for world.⁶²⁰ This critique is misguided. My role in assessing the economic effects of the Challenged Conduct is to compare the actual world to a world that is otherwise identical except for the Challenged Conduct. And that is what I did. My initial report calculates Zuffa's foreclosure share based on the proportion of Fighters in the Relevant Input Market and Submarket subject to Zuffa's exclusionary contracts—holding everything else constant. Dr. Topel himself acknowledges that my damages calculations isolate the effect of Zuffa's exclusionary contracts on Class members.⁶²¹ To the extent that other aspects of the Challenged Conduct suppressed Fighter compensation, my damages estimates are therefore conservative. A reduction in the share of Fighters bound by these exclusionary contracts results in increased competition, and hence greater compensation for Fighters. In particular, my damages model projects but-for wage shares for Zuffa Fighters when the foreclosure share falls to 30 percent—that is, in a but-for world where Zuffa forecloses up to 30 percent of the Relevant Input Market with the challenged contracts.⁶²² There are many potential

619. Topel Report ¶30.

620. *Id.*

621. *Id.* ¶201 (“[W]hen computing damages using his foreclosure regression benchmark, Dr. Singer only estimates the harm due to the alleged foreclosure provisions. Dr. Singer makes no attempt to establish that there was anticompetitive harm from other elements of Plaintiffs’ Challenged Conduct apart from the exclusive aspect of PAR contracts or to estimate damages attributed to those elements[.]”). As Dr. Topel acknowledges, the element of the Challenged Conduct for which my regression computes impact or damages is the allegedly exclusionary contractual provisions. The other elements of the Challenged Conduct contribute to impact or damages only to the extent that they cause more Fighters to sign the challenged contracts.

622. Singer Report ¶¶250, 252. I have conservatively assumed that Zuffa could have foreclosed up to 30 percent of the Relevant Input Market with long-term exclusive contracts of the type it currently uses given that, as I understand it, certain legal decisions find that a firm with market power can foreclose up to 30 percent of a market without having anticompetitive effects. *Id.* ¶153.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

procompetitive industry arrangements that would have existed absent the Challenged Conduct, and in particular, absent the challenged exclusionary provisions in Zuffa's Fighter contracts.

189. I nonetheless elaborate here on my view of Zuffa's plausible contracting arrangements in the but-for world, based on Dr. Topel's own reasoning and relevant record evidence. One source of evidence to inform this aspect of a world without the challenged contracts would be to look to the Fighter contracts that Zuffa used *before* its market power had expanded to the levels observed during the Class Period, combined with an assessment of the fighter contracts of smaller MMA promotions that lack substantial market power. As Dr. Topel has opined, in certain contexts, conduct engaged in by firms without substantial market power can (though as discussed below, often do not) reflect procompetitive responses to competition.⁶²³

190. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

623. See Topel Report ¶25.

624. See Topel Dep. at 358:20-25 ("Q. Would you agree with me that the conduct engaged in by a firm without market power . . . could have anticompetitive effects when that same conduct is engaged in by a firm with market power? A. That's conceivable."); see also Salop (2017) at 374, n.10 ("...where the conduct by a competitive firm is determined to be procompetitive, that showing alone does not imply that the same conduct by a dominant firm would be procompetitive").

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

626. Blair Dep. at 112:25-115:6 (“Q. Does the same logic of [the umbrella pricing] model apply ... to non-price transactional terms such as who bears the risk of injury, for example? A. ... [W]hen we start to talk about some of these terms ... one would expect ... maybe not initially, but you would expect the terms to wind up being roughly the same ... in a market ... just through adjustments over time as you move to an equilibrium.”).

627

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

-141-

[REDACTED]

191.

[REDACTED]

629.

[REDACTED]

630. Singer Report ¶174.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

192. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

193. As to the length of the term, Dr. Topel recognized that smaller MMA promotions use single-bout contracts.⁶³¹ Accordingly, given that some smaller MMA promotions utilize single-bout contracts, even the one-year/three-bout contract may be unduly restrictive.

194. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

631. See, e.g., Topel Dep. at 288:10-23 (“Q. Would it be fair to say that even if Zuffa were required to only have single-bout contracts, it would still have some incentive to invest in promoting the UFC, correct? ... A. I suppose that might be true. I mean, I don’t know the answer to your question because I suppose we have some comparisons to smaller outfits, King of the Cage or something like that. I mean, they have websites that say here with the fighters they have and historically have and here’s the casino we’re having a show in. So I believe those folks have shorter contracts.”).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

195. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

632. Singer Report ¶107; *id.* ¶¶135-136.

633. [REDACTED]

634. *See id.* at 323:9-23 (“Q. So MMA promotions that don’t have market power use a provision that would allow them to go to Zuffa in order to attract them to come to their promotion; is that your opinion? A. Some entities include in their contract in order to attract fighters the right to move to Zuffa. Q. [I]s that efficient? A. Well, given that it survives for those entities, it’s probably an efficient way of attracting people.”); *see also id.* at 324:25-325:10 (admitting that Zuffa-out clauses used by Zuffa’s rivals without market power are procompetitive by virtue of prior logic that undergirds his efficiency defense of certain restrictions, and stating “For these entities in the situations that they’re in the fact that they use a business practice that . . . don’t have any material market power, the fact that they use that business practice means that it has a procompetitive rationale for them”).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

196. Other aspects of the but-for world contracting scheme could also be characterized based on the benchmarks provided by MMA promoters that lack market power. For example, smaller MMA promotions frequently engaged in co-promotion with another MMA promotion, or allowed Fighters to enter bouts with another promotion.⁶³⁵ And, indeed, even Zuffa itself recently engaged in co-promotion in a market in which it did not have market power, namely, boxing. Thus, in a but-for world, we would expect to see enhanced co-promotion—that is, Fighters from different MMA promotions matched against each other. Given the heightened state of competition, promoters would maintain substantial incentives to engage in promotional activity. Even Dr. Topel admitted that if Zuffa were required to only have single-bout contracts, it would still have an incentive to invest in promoting fights.⁶³⁶ He further admitted that it would not be procompetitive for Zuffa to lock up fighters for life because “Zuffa would capture the entire returns to their human capital investments,”⁶³⁷ and that promotions with Zuffa-out clauses still have an incentive to invest in the promotion of their fighters.⁶³⁸

635. See Part V.A.2, *infra*.

636. Topel Dep. at 288:10-23 (“Q. Would it be fair to say that even if Zuffa were required to only have single-bout contracts, it would still have some incentive to invest in promoting the UFC, correct? ... A. I suppose that might be true. I mean, I don’t know the answer to your question because I suppose we have some comparisons to smaller outfits, King of the Cage or something like that. I mean, they have websites that say here with the fighters they have and historically have and here’s the casino we’re having a show in. So I believe those folks have shorter contracts.”).

637. *Id.* at 291:16-25 (“Q. You’re an economist and I’m asking you whether it would be procompetitive if it were legal for Zuffa to require as a condition to fighting with the UFC that the fighter could never fight for another MMA promotion? A. I doubt it. Q. Why not? A. Because as people’s talents play out...you know, Zuffa would capture the entire returns to their human capital investments.”).

638. *Id.* at 323:1-8 (“Q. And is it your understanding that despite these Zuffa out clauses these MMA promotions that have these clauses still have incentive to invest in their promotion of their fighters? A. They have some incentive to invest, and in order to attract them they have a clause that gave those fighters the right to go to a particular entity.”).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

197. In the but-for world, other MMA promoters would be able to compete effectively with Zuffa for Fighter services, because they would not be foreclosed from a critical input.⁶³⁹ Competition in the but-for world would lead MMA promoters, including the UFC, to increase the compensation they pay to their Fighters relative to the actual world. And the increased compensation in turn would attract more athletes to the sport and cause them to invest more in their performances: In the but-for world, Fighters and their management would have the incentive and the ability to invest more in their own promotion and training, thereby enhancing and improving the sport of MMA.⁶⁴⁰ The increase in the number of competitive MMA promoters means that the market would, to use Dr. Oyer's term, become "thicker."⁶⁴¹ As Dr. Oyer admitted, in a "thicker labor market with more employees and workers," there would be greater surplus and greater productivity, but any given firm is likely to get a smaller share of that surplus because the competition, among other things," would "force the firm to pay higher wages to the worker."⁶⁴² In other words, without the Challenged Conduct there would be greater productivity—that is, more and better events—and greater surplus—that is, the promoters and the fighters would have more total revenue to share—and the workers—that is, the Fighters—would receive greater compensation—even though any given firm—that is, the UFC—might enjoy less of the overall revenue from MMA.

639. Singer Report Part III.C.1.

640. See Part V.A.1, *infra* (reviewing the literature on non-compete clauses showing that contracts that prevent locked-in workers from taking their developed talents to a rival can discourage employees from investing in their own human capital, and finding that the overall effect of restraints on worker mobility is a to reduce human capital investments).

641. See Oyer Dep. at 193:19-22 (noting "a thicker labor market is one with more participants and a thinner one is one with fewer participants").

642. *Id.* at 200:20-201:3 ("Q: Okay. So in the thicker labor market with more employers and more workers, all else equal, what we expect is greater surplus and greater productivity, but any given firm is likely to get a smaller share of that surplus because the competition, among other things, can force the firm to pay higher wages to the worker? A: Yeah. And—exactly."); see also *id.* at 201:17-202:3 ("a thicker market. . . means that there are more employers and more workers and will tend to create overall surplus and overall productivity and higher wages or higher compensation, but lower amounts of surplus may go to any one employer; is that fair? A: Yes.").

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

198. In summary, based on Dr. Topel's own reasoning and the record evidence recounted above, a plausible but-for world would include substantially shorter duration fighter contracts (of one year or less), with no Right-to-Match provision, clauses that allow fighters enhanced mobility, an easier and more certain route to free-agency, and enhanced co-promotion. Even with less market power, Zuffa and its MMA rivals would have sufficient incentives to invest in promotions and Fighters. And because Fighters would keep a greater share of their MRP, Fighters would have added incentive to invest in training and promoting themselves in the but-for world.

2. The Most Plausible Damages Result Is The \$1.6 Billion Calculation Derived From My Impact Regression

199. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

643. Singer Report ¶183.

[REDACTED]

200. My initial report explained that, for a variety of reasons, damages should not be constrained by the contemporaneous revenue and profit earned by Zuffa in the actual world, in which output was artificially suppressed by the Challenged Conduct.⁶⁴⁵ Thus, the appropriate analysis looks to the available revenues earned by Zuffa and other MMA promoters in the but-for world. Dr. Topel agrees with me that the appropriate analysis of damages looks to the but-for world, and not the actual world, to determine the pool of revenues available to pay Fighters.⁶⁴⁶

201. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

202. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

644. Topel Report ¶287. Dr. Blair recognizes that “Bellator (and Strikeforce before it) competed against Zuffa in the market, and were thus subject to market forces in part affected by Zuffa’s competition.” Blair Report ¶73.

645. Singer Report ¶246.

646. Topel Dep. at 422:22-423:18, 425:9-426:3.

647. Singer Report ¶246; *see also* Part I.B.3, *supra*.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

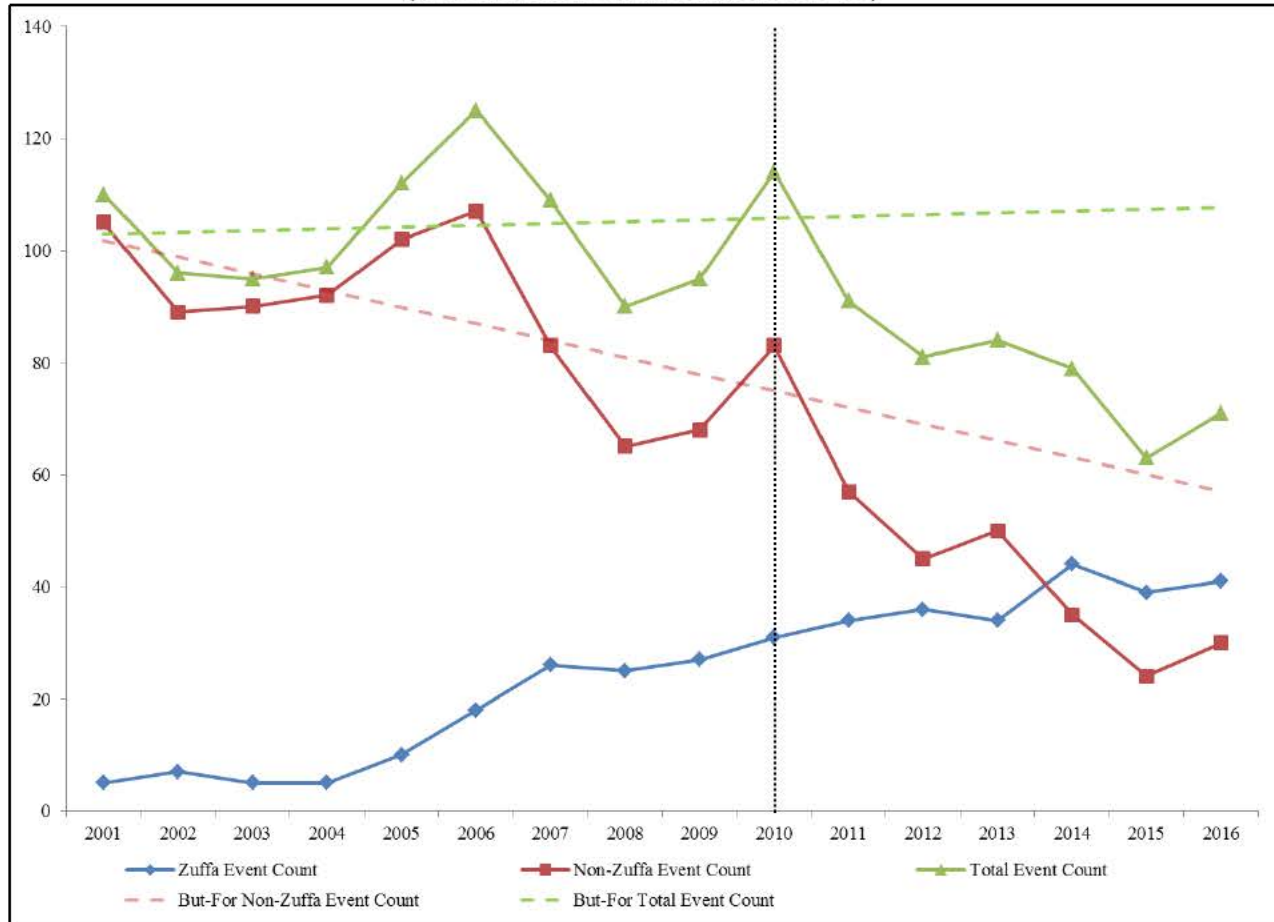
[REDACTED]

203. In my initial report, I demonstrated that the supply of Live MMA Events featuring at least one Headliner had an essentially flat trend from 2001 to 2010, but declined substantially during the Class Period.⁶⁴⁸ As seen below, the supply of such events from non-Zuffa promoters dropped off steeply, while the supply of such events from Zuffa did not increase by nearly enough to make up the difference.

648. Singer Report Figure 4C.

-149-

SUPPLY OF LIVE MMA EVENTS FEATURING HEADLINERS
(SINGER INITIAL REPORT, FIGURE 4C)



Note: Non-Zuffa Promoters include those encompassed by the Headliner definition of the Relevant Input Market. Events featuring at least one Headliner are displayed.

204.

649.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

205.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

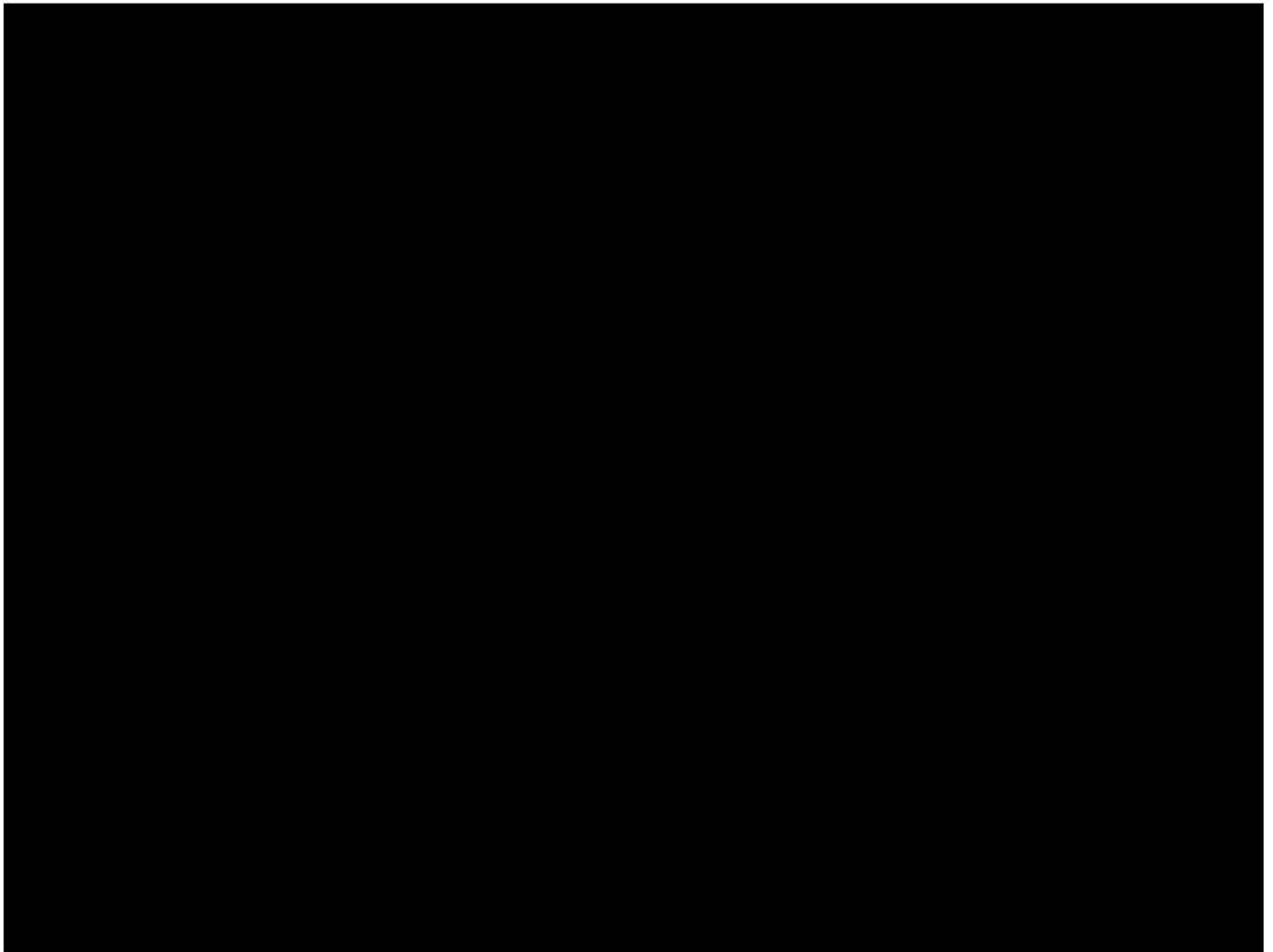
650. Singer Report, Table 11.

651.

[REDACTED]

652. WME_ZUFFA_00001150, slide 5.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER



206. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

653. [REDACTED]

[REDACTED]

654. See Appendix Table A5.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

207. [REDACTED]

[REDACTED]

208. [REDACTED]

[REDACTED]

655. Singer Report, Table 11.

656. [REDACTED]

[REDACTED]

657. To maintain consistency with my prior damages calculations, I project but-for revenues through June 30, 2017. However, I conservatively assume that the but-for supply of events does not increase in 2017, relative to 2016. Thus, the projected but-for industry Event Revenue for the first half of 2017 is equal to one half of the projected Event Revenue for all of 2016. *See* Appendix Table A5.

658. *See* Appendix Table A5.

659. WME_ZUFFA_00001150, slide 5.

660. Noah Kirsch, Exclusive: Billionaire Fertitta Brothers Sell Remaining UFC Stakes At \$5 Billion Valuation, FORBES, Sept. 7, 2017, available at: <https://www.forbes.com/sites/noahkirsch/2017/09/07/exclusive-billionaire-fertitta-brothers-sell-remaining-ufc-stakes-at-5-billion-valuation>.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

209. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

V. ZUFFA'S CLAIMED EFFICIENCY JUSTIFICATIONS FOR THE CHALLENGED CONDUCT ARE WITHOUT MERIT

210. My initial report reviewed various efficiency defenses of some or all of the Challenged Conduct that Zuffa, or economists acting on its behalf, had proffered in past proceedings, and explained that these prior efficiency defenses were unavailing.⁶⁶³ As explained below, many of the efficiency justifications offered by Zuffa's economists in the current proceeding are the same or similar to those used in prior proceedings, and are wrong for the same

661. In 2017, Frank and Lorenzo Fertitta sold their remaining 5.8 percent stake in the UFC in a new deal that valued the UFC at approximately \$5 billion, implying a sales price of approximately $[5.8\%] \times [\$5 \text{ billion}] = \290 million. *Id.*

662. Davis Report ¶114.

663. Singer Report ¶¶257-285.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

or similar reasons. To the extent that Zuffa's economists have presented new efficiency justifications here for the first time, they are equally unavailing. Moreover, Zuffa's economists make no effort to quantify the purported procompetitive benefits of the Challenged Conduct (if any). This is a critical deficiency because the factfinder cannot balance any purported efficiencies against the demonstrable harm that I have calculated to Class Members as well as the additional anticompetitive effects I have demonstrated in terms of reduced output of MMA events and higher prices.⁶⁶⁴

211. The efficiency defenses put forth by Zuffa's economists amount to the claim that, in essence, Zuffa should be permitted to exercise monopsony power for the good of the sport. It bears emphasis that my initial report anticipates such claims, which echo the historical claims of professional sports owners, attempting to justify labor-market restrictions on athletes by claiming that they were necessary to incentivize investment for the benefit of the sport.⁶⁶⁵ But the evidence from introducing free agency and enhanced athlete mobility into other professional sports, and the extensive sports economics literature, indicate just the opposite: Removing the restraints on Fighters imposed by the Challenged Conduct would likely benefit Fighters, fans, and the industry as a whole.⁶⁶⁶ Significantly, Zuffa's economists—one of whom (Dr. Blair) is a sports economist—make no attempt to rebut this extensive evidence.

A. Dr. Topel Provides No Evidence That the Challenged Conduct Increased Investments in Fighters Specifically or MMA Generally

212. Dr. Topel claims that the Challenged Conduct resulted in higher investment in Fighters specifically and MMA generally:

^{664.} *Id.* Part III.D.4-5; *see also* Part I.B.3, *supra*.

^{665.} Singer Report ¶¶286-290.

^{666.} *Id.*

[REDACTED]

As explained below, Dr. Topel provides no evidence demonstrating that the Challenged Conduct enhanced investment, nor any analysis quantifying the extent to which investment in Fighters or MMA would be reduced in the absence of the Challenged Conduct. Dr. Topel also fails to provide any evidence of the purported [REDACTED]⁶⁶⁸ supposedly overcome by the Challenged Conduct. Finally, Dr. Topel ignores the clear economic incentives that Fighters would have faced in the but-for world to use the proceeds from their elevated compensation to invest in their own promotion, training, and human capital.

1. Dr. Topel Provides No Evidence That the Challenged Conduct Enhanced Investment

213. Dr. Topel admits that the Challenged Conduct permits Zuffa to exercise monopsony power: Dr. Topel concedes that, in the absence of the Challenged Conduct, [REDACTED]
[REDACTED]⁶⁶⁹ resulting in a
[REDACTED]⁶⁷⁰ Thus, removal of the Challenged Conduct would cause Zuffa to pay its Fighters more (or lose them to other promoters) by making the labor market more competitive. This amounts to a concession by Dr. Topel that the Challenged Conduct constitutes an exercise of Zuffa's monopsony power to suppress Fighters' compensation. Dr. Topel is left to claim, without evidence, that these benefits to Fighters would be transitory because removal of the Challenged Conduct would result in lower investment in MMA over the

667. Topel Report ¶25.

668. *Id.*

669. *Id.* ¶68.

670. *Id.*

long run.⁶⁷¹ As explained below, Dr. Topel has no hard evidence to support his claim, while the evidence against it is extensive.⁶⁷²

214. Dr. Topel claims that the Challenged Conduct “assist[s] in protecting promoters’ investments and building a business”⁶⁷³ by preventing so-called “free-riding.”⁶⁷⁴ In economics, free riding refers to the ability of one party to capture the returns to investments made by another party, which can discourage future investment.⁶⁷⁵ But economists and antitrust authorities recognize that, although a dominant firm itself may benefit from preventing free riding, competition overall may be harmed if “the conduct simultaneously raises the costs of competitors or barriers to entry or expansion.”⁶⁷⁶ For this reason, the claimed efficiencies must be weighed against the anticompetitive harms, in a “balancing of probabilities [that] is carried out in the rule of reason analysis.”⁶⁷⁷ My initial report does just that, demonstrating that the net effect of the Challenged Conduct was to harm competition in myriad ways.⁶⁷⁸

215. In contrast, Dr. Topel provides no evidence whatsoever quantifying the purported procompetitive benefits of eliminating free riding, nor does he even attempt to show that these

671. Topel Report ¶68.

672. Singer Report Part III; *id.* ¶¶286-290. Dr. Topel admitted in his deposition that elimination of the reserve clause increased compensation to professional baseball players because “property rights were transferred from the team to the players.” Topel Dep. at 140:19-22. Dr. A. Blair agrees that the demise of the reserve system and the advent of competition through free agency led to a dramatic increase in the salaries of professional baseball players. Blair Dep. at 37:14-17; Dr. Blair agrees that the reserve system transferred wealth from the players to the owners, by giving the owners a property right in the players’ contracts. *Id.* at 98:22-99:7.

673. Topel Report ¶¶85-89.

674. *Id.* ¶¶85-89.

675. Modern IO at 414.

676. Salop (2017) at 378.

677. *Id.* Moreover, “[w]hen exclusivity is instituted by a monopolist against all of its competitors,” as is the case here, “there is a greater likelihood that the harms dominate the benefits.” *Id.* at 396. *See also* PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION, ¶ 737 (4th ed. 2017) (“a firm’s conduct might consist largely of ordinary business practices, yet be highly exclusionary because of the industry structure and the firm’s market power.... [B]ehavior that is rational for a firm with little or no market power may nevertheless produce substantial and unnecessary anticompetitive effects when wielded by a firm with considerable market clout”).

678. Singer Report Part III.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

speculative procompetitive benefits outweigh the harms of the Challenged Conduct, including the harms that Dr. Topel himself identifies (namely, reduced Fighter compensation). Dr. Topel's expert report contains no evidence or analysis demonstrating that investment in MMA generally or in Fighters specifically would have been lower in a but-for world without the Challenged Conduct.⁶⁷⁹

216. In his deposition, Dr. Topel admitted that he made no effort to calculate the extent to which "investment in athletes" would decline if the challenged contractual provisions were eliminated.⁶⁸⁰ Similarly, Dr. Topel admitted that he made no calculations of the extent to which promotion of MMA generally would decline in the absence of the Challenged Conduct.⁶⁸¹ Dr. Topel also conceded that Zuffa invested resources in helping to grow the sport of MMA and in promoting MMA athletes in the early 2000s, despite a lack of "evident market power,"⁶⁸² and despite "contracts of shorter duration."⁶⁸³ Dr. Topel further acknowledged that absent the Challenged Conduct, Zuffa would still have made some investment in the show Ultimate Fighter;⁶⁸⁴ that he made no effort to calculate the extent of his claimed investment reductions associated with the removal of the Challenged Conduct; that he did not calculate the claimed impact of the Challenged Conduct on promotion generally or on Zuffa's investment in Fighters;⁶⁸⁵

679. Part V.B of Dr. Topel's report, titled "Exclusivity and Multi-Bout Contracts Assist in Protecting Promoters' Investments and Building a Business," is devoid of record evidence, or any evidence specific to Zuffa or MMA; it includes only a general discussion of free riding in the economic literature.

680. Topel Dep. at 150:1-12 ("Q. You don't in your report quantify the total amount of promotional investment in athletes that you believe would be lost if the challenged contractual provisions were eliminated, do you? A. You mean do I have a dollar amount on it? Q. Correct. A. We didn't put a dollar amount, no.").

681. *Id.* at 153:18-25 ("Q. Can you show me a table in your report where you quantify the amount of promotional dollars that – I'm sorry – the amount of additional promotional dollars that would be lost in either of those two but-for worlds? Is there a table in your report where I can find that? A. No. That's not part of my analysis or part of my opinions.").

682. *Id.* at 330:24-331:7.

683. *Id.* at 331:8-10.

684. *Id.* at 148:20-24.

685. *Id.* at 153:18-25.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

that he did not compute the claimed amount of lost Event Revenue, if any, absent the Challenged Conduct;⁶⁸⁶ that he did not compute the claimed reduction in output, if any, that would be caused by any purported increase in transactions costs in the but-for world;⁶⁸⁷ and that he did not compute the claimed increase in output, if any, attributable to the purported reduction in transactions costs associated with the restrictive fighter contracts.⁶⁸⁸

217. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

686. *Id.* at 163:23-164:1.

687. *Id.* at 165:23-166:2.

688. *Id.* at 168:2-7.

689. One study, which compares Silicon Valley to Boston's Route 128 technology district, found that Silicon Valley performed well due to the greater employee movement allowed in California, while in Massachusetts, enforcement of non-compete clauses restricted labor mobility and chilled innovation. *See* Ronald J. Gilson, *The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128, and Covenants Not To Compete*, 74 NEW YORK UNIV. L. R. 575 (Jun. 1999). Another study used both a time series analysis of states that changed their enforcement of non-compete clauses, as well as a cross-sectional analysis comparing states with enforcement of non-competes to states without. That study found that low-enforcement jurisdictions (those with greater labor mobility) had higher investment, as measured both by R&D investment, and capital-intensity of production. Mark J. Garmaise, *Ties*

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

218. In his report, Dr. Topel refers to deposition testimony from UFC's Assistant General Counsel Michael Mersch, claiming [REDACTED]

[REDACTED]

[REDACTED]⁶⁹² Dr. Topel also references similar deposition testimony from WSOF CEO Carlos Silva, stating tha [REDACTED]

that Truly Bind: Non-competition Agreements, Executive Compensation and Firm Investment, 27 J. OF LAW, ECON. AND ORG. 376 (Aug. 2011). Another study empirically tested the free-rider hypothesis by measuring the effect of marginal dollar of venture capital investment on patent filings, new business establishments, and job creation. The authors found that states that enforce non-competes experience a lower return on venture capital investment than states that proscribe enforcement. *See* Sampsa Samila & Olav Sorenson, *Noncompete Covenants: Incentives to Innovate or Impediments to Growth*, 57 MANAGEMENT SCIENCE 425-38 (2011). *See also* Omri Ben-Shahar, *California Got It Right: Ban The Non-Compete Agreements*, FORBES, Oct. 27, 2016 ("The evidence confirms that firms invest more in R&D and in worker development when their investment is protected by the non-compete clauses. But it also shows that workers who are locked-in invest less in self-training, and that this effect is dominant. Put simply, restraints on workers' mobility reduce overall investment in human capital."), available at <https://www.forbes.com/sites/omribenshahar/2016/10/27/california-got-it-right-ban-the-non-compete-agreements>.

690. Topel Dep. at 154:15-20; *see also id.* at 279:5-9.

691. *Id.* at 157:5-16.

692. Topel Report at ¶68 (citing Deposition of Michael Mersch, (July 14, 2017), at 164-165).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]⁶⁹³ This testimony does not quantify the procompetitive benefits (if any) of exclusive contracts of the type Zuffa has employed during the Class Period, let alone establish that these purported benefits outweigh the anticompetitive harm generated by the Challenged Conduct. It also fails to establish whether or the extent to which any of these speculative, unquantified efficiencies would be lost if the Challenged Conduct were removed, given that multi-bout contracts could still exist in the but-for world (so long as their duration was sufficiently short and other restrictions on mobility were eliminated), as explained in Part V.C.3 below.

219. [REDACTED]

[REDACTED] [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

693. *Id.* (citing Deposition of Carlos Silva, April 18, 2017, at 196-97).

694. *Id.* ¶¶83-84.

695. *Id.*

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

220. Dr. Topel's free-rider justification for the Challenged Conduct is also undermined by the fact that Zuffa does not invest particularly intensively in Fighters' human capital, but instead itself free rides on investments by "minor league" promoters and the fighters themselves. Jeffrey Aaronson, CEO of Titan, testified that the UFC was not interested in promoting fighters "very early in development" and thus fighters needed to build a record elsewhere before having a chance at the UFC.⁶⁹⁶ Joe Silva, Zuffa's lead matchmaker, testified similarly that fighters needed to have a demonstrated record of success at other promotions in order to get a UFC contract.⁶⁹⁷ In addition, as I explained in my opening report, Zuffa does not invest in fighter training; instead fighters are expected to cover those costs themselves.⁶⁹⁸ Dr. Topel admitted in his deposition that he did not quantify the amount that Zuffa spent on promoting fighters, or any fighter in particular,⁶⁹⁹ nor did he quantify Zuffa's promotion of its own brand as opposed to promoting its Fighters.⁷⁰⁰

2. Dr. Topel Provides No Evidence of Purported "Transactions Costs," Which Have Not Prevented Co-Promotion in MMA or Boxing, or Competitive Matchups in Non-Combat Sports

221. Dr. Topel claims that the Challenged Conduct reduces the "substantial transaction costs associated with setting up and promoting interest in MMA."⁷⁰¹ Yet he provides not a single estimate of the magnitude of these purported transactions costs, and provides no record evidence of

696. Deposition of Jeffrey Aronson, April 25, 2017, at 28:20-24 [hereafter "Aronson Dep."] See also *Id.* at 26:13-18 ("The problem is the UFC is typically not looking for a kid who is 2-0 or 3-0, so they have to fight. It has become an epidemic. I started talking to other managers in the field and everybody has the same problems.").

697. Silva Dep. at 114:13-119:15.

698. Singer Report ¶21, n.36.

699. Topel Dep. at 149:7-22.

700. *Id.* at 150:13-24.

701. Topel Report ¶90.

their supposed economic significance. As explained below, record evidence indicates that MMA promoters, including Zuffa, are willing to co-promote, and do co-promote, in circumstances in which they lack substantial market power. Such co-promotion would not occur if the transactions costs of co-promotion were prohibitive, as Dr. Topel claims. On the other hand, Zuffa faces clear incentives not to co-promote in the actual world: Doing so would undermine the effect of the Challenged Conduct, which is to foreclose Zuffa's rivals from a key input necessary to compete effectively.⁷⁰² For Zuffa, engaging in co-promotion would risk allowing a rival promoter to gain "traction" by being associated with successful Live MMA Events.⁷⁰³ Given that Zuffa's refusal to co-promote cannot be explained by purported transactions costs, but can be explained the Challenged Conduct, it is reasonable to infer that co-promotion likely would be employed by Zuffa (and other MMA promoters) in the but-for world.⁷⁰⁴

222. Dr. Topel speculates that Zuffa's contracts restricting athlete mobility and Zuffa's horizontal acquisitions permitting Zuffa to control a deep roster of high-ranked fighters, has allowed Zuffa to avoid the purported transactions costs associated with two MMA organizations promoting a shared MMA event.⁷⁰⁵ As demonstrated below, co-promotion is common in the MMA industry among smaller promoters that lack Zuffa's market power, as well as in boxing. Indeed,

702. Singer Report Part III.C; *see also* Part I.C, *supra*.

703. [REDACTED]

704. It bears noting that, although co-promotion would likely have occurred more frequently in the but-for world, co-promotion is not necessary to effectuate more competitive compensation outcomes in the but-for world. What matters is that, in the but-for world, rivals would be able to attract a critical mass of Fighters and thus be capable of competing effectively with Zuffa. This could occur without increased co-promotion. For example, if a rival promoter could lure (say) the even-numbered-ranked fighters from Zuffa, this might suffice to give the rival the necessary critical mass.

705. Topel Report ¶95 ("Inherent to this solution to the transaction cost issue is that the marketplace will rely on matches between athletes contracted to the same promoter. Co-promoted matches, in which athletes from different MMA promoters compete against one another, are apparently non-existent.").

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Zuffa itself expressed interest in co-promotion with MMA rivals before it acquired the degree of market power that it possessed during the Class Period, and still co-promotes events with boxing promoters—that is, in a market in which it lacks market power. If the transactions costs associated with co-promotion were prohibitive, as Dr. Topel contends, one would not expect to see so many examples of co-promotion in the sport. That we observe it so frequently implies that either the transactions costs are low or the benefits of co-promotion exceed the (manageable) transactions costs. In light of the frequency with which non-Zuffa MMA promoters co-promote, it is curious that Topel would describe co-promotion as “apparently non-existent” in MMA.⁷⁰⁶

223. Other MMA promoters historically and currently use co-promotion to expand the demand for their events. In 2009, Scott Coker, then-president of Strikeforce, predicted that Strikeforce would “be in Japan doing a co-promotion [with DREAM] in relatively short time.”⁷⁰⁷ Coker explained in 2010 that “The way our company philosophy has always promoted or it has not been afraid of *co-promoting*. We did it when we got into the business in mixed martial arts with, at the time, EliteXC. We’ve done it with M-1. We’ve done it with Dream.”⁷⁰⁸ In the same year,

706. *Id.*

707. John Morgan, “Strikeforce CEO Scott Coker Predicts Dream Co-Promotion in Relatively Short Time,” *MMA Junkie* (Aug. 17, 2009), available at <http://mmajunkie.com/2009/08/strikeforce-ceo-scott-coker-predicts-dream-co-promotion-in-relatively-short-time>.

708. [REDACTED]

Coker expressed a willingness to co-promote a fight with Bellator, featuring two of the world's top 155-pound fighters.⁷⁰⁹ To land Fedor Emelianenko, Strikeforce reportedly had to permit the Russian star's M-1 Global promotion to co-promote events with Strikeforce.⁷¹⁰ In November 2011, One FC of Singapore announced that it had entered a partnership with leading Japanese promoter Dream.⁷¹¹ In January 2012, ProElite MMA and DREAM announced the initiation of a promotional partnership and fighter exchange program.⁷¹² In December 2016, Bellator 169 was a co-promotion with UK-based BAMMA.⁷¹³ Coker explained in May 2017 that the most logical way for Bellator to compete in Poland was to co-promote with Poland's KSW.⁷¹⁴ In a November 2017 letter to Congress, Bellator testified that it "frequently *co-promotes* events with smaller domestic local promoters and international fight promoters to enhance our events and allow them opportunities to showcase their league talent."⁷¹⁵ Similarly, Mr. Aronson of Titan FC testified that if Bellator or "World Series [of Fighting] wanted to put one of their fighters against a Titan fighter, I'd be all for it."⁷¹⁶

224. Prior to securing the degree of monopsony power it possessed during the Class Period, Zuffa itself entertained the concept of co-promotion. In Dana White's first interview after

709. Nick Thomas, *Strikeforce open to Bellator co-promotion, Gilbert Melendez vs. Eddie Alvarez: A potential fight*, BLOODY ELBOW (May 17, 2010), available at <https://www.bloodyelbow.com/2010/5/17/1476096/strikeforce-open-to-bellator-co>.

710. *Strikeforce CEO Coker Sees Endless Possibilities*, LAS VEGAS SUN, Aug. 18, 2009, available at <https://lasvegassun.com/news/2009/aug/18/strikeforce-ceo-coker-sees-endless-possibilities/>.

711. *Dream, One FC Form Alliance, Plan March 31 Co-Promotion*, SHERDOG, Nov. 28, 2011, available at <http://www.sherdog.com/news/news/Dream-One-FC-Form-Alliance-Plan-March-31-CoPromotion-37500>.

712. *ProElite and DREAM form new promotional partnership and fighter exchange program*, MMA MANIA, Jan. 18, 2012, available at <https://www.mmamania.com/2012/1/18/2715790/proelite-dream-co-promotion-partnership-ufc>.

713. *An Olympic gold medallist, 'King Mo' and a big night in Dublin for Irish MMA*, THE 42, Dec. 16, 2016, available at <http://www.the42.ie/bellator-169-bamma-27-preview-3141650-Dec2016/>.

714. Jim Edwards, *Scott Coker Talks Bellator Going to Ireland, Poland, Brazil, KSW and ACB*, CREATORS.CO, May 18, 2017, available at <https://champions.co/p/scott-coker-talks-bellator-ireland-poland-brazil-ksw-acb/4272912>.

715. Bellator letter to Congress re Ali Act (Testimony of Tracey Lesetar-Smith Bellator MMA) <http://docs.house.gov/meetings/IF/IF17/20171109/106604/HHRG-115-IF17-20171109-SD011.pdf> (emphasis added).

716. Aronson Dep. at 58:3-22.

becoming president of Zuffa, he explained that “And my main goal, the main guy I want to get together with. Even if I have to *co-promote* with PRIDE, and we don’t have a problem with co-promoting, they do it in boxing...”⁷¹⁷ White even intimated that the transactions costs would be insignificant: “Yukino and PRIDE really want Tito. And we really want Sakuraba. So I don’t see why we can’t work something out. I enjoy working with PRIDE. I respect them, so I don’t see a problem.”⁷¹⁸ In 2003, the UFC permitted Chuck Liddell to fight in PRIDE, with the idea that Liddell would defeat Pride’s stars, and return with the PRIDE Title.⁷¹⁹ UFC’s Carlos Newton went back and forth between PRIDE and UFC between 1998 and 2004.⁷²⁰

225. Finally, MMA promoters have allowed Fighters to compete in non-MMA promotions. In 2015, Bellator’s Joe Schilling signed a new deal with kickboxing promoter GLORY.⁷²¹ As head of Bellator, Coker permitted one of his MMA fighters, Michael “Venom” Page, to participate in a boxing match in London in 2017.⁷²² In July 2017, Bellator reportedly allowed Michael Page to compete in boxing to help keep his skills sharp while preparing for his

717. Dana White UFC President Interview, Interview by Tony Rojas, (undated), *available at* <http://www.primetimefighters.net/interview2.htm> (emphasis added).

718. *Id.*

719. DIRECTV Interview with Dana White (undated), *available at* <http://www.directv.com/see/landing/pride-interview.html>.

720. Carlos Newton “The Ronin,” Mixed Martial Arts, (undated), *available at* <http://www.mixedmartialarts.com/fighter/Carlos-Newton:AF8B7F51248A75F7>.

721. Mike Bohn, *Bellator’s Joe Schilling signs with GLORY, plans kickboxing and MMA in 2015*, MMA JUNKIE, Jan. 7, 2015, *available at* <http://mmajunkie.com/2015/01/bellators-joe-schilling-signs-with-glory-plans-kickboxing-and-mma-in-2015>.

722. *Scott Coker open to five-round main events, Michael Page vs. Paul Daley ‘winner takes all’ match*, PRIMAL FIGHT LEAGUE, Oct. 24, 2017, *available at* <https://primalfightleague.com/scott-coker-open-to-five-round-main-events-michael-page-vs-paul-daley-winner-takes-all-match/>.

next MMA bout.⁷²³ In 2017, Zuffa co-promoted a boxing match featuring MMA fighter Conor McGregor.⁷²⁴

226. Co-promotion is also a common practice in boxing.⁷²⁵ Dr. Topel provides no evidence that the purported “transactions costs” of co-promotion should be prohibitive for MMA, yet insignificant for boxing. Dr. Topel claims that the lack of “independent sanctioning organizations”⁷²⁶ to “negotiat[e] matches between athletes”⁷²⁷ explains why co-promotion is common in boxing but not MMA; according to Dr. Topel, MMA lacks an “independent arbiter ...that can resolve the disparate incentives...and ensure that beneficial matches will take place.”⁷²⁸ This opinion is devoid of economic content; in reality, economic theory predicts that two promoters face clear economic incentives to combine Fighters in the most valuable matchups, with or without an independent sanctioning organization.⁷²⁹ This prediction is borne out by the evidence

723. Shaun Al-Shatti, *Scott Coker: Paul Daley vs. Michael Page planned for early 2018, 'MVP' to box in interim*, MMA FIGHTING, July 4, 2017, available at <https://www.mmafighting.com/2017/7/4/15882564/scott-coker-paul-daley-vs-michael-page-planned-for-early-2018-mvp-to-box-in-interim>.

724. Trent Reinsmith, *UFC's Dana White Says Floyd Mayweather-Conor McGregor Boxing Match Sold 6.7 Million PPVs*, FORBES, Oct. 25, 2017, available at <https://www.forbes.com/sites/trentreinsmith/2017/10/25/ufc-president-dana-white-says-floyd-mayweather-vs-conor-mcgregor-boxing-match-sold-6-7-million-ppvvs/>.

725. [REDACTED]

726. Topel Report ¶91.

727. *Id.*

728. *Id.*

729. Indeed, in the but-for world, such independent organizations could arise, just as they did in boxing to fulfill the same role.

reviewed above, which shows that MMA promoters without market power are willing to engage in co-promotion—including Zuffa itself when it lacks market power (as illustrated by Mayweather-McGregor). More generally, it is borne out in the sports economics literature reviewed in my initial report, which shows that competitive markets produce the most compelling matchups by allowing talent to flow to its highest-valued use.⁷³⁰ Finally, purported transactions costs clearly have not prevented teams in professional sports leagues from scheduling games against one another—year after year, season after season, in sport after sport—despite the absence of common ownership of the competing teams.

B. Dr. Topel Fails to Demonstrate the Challenged Conduct Permitted the UFC to Succeed by Procompetitive Means

227. My initial report demonstrates that the Challenged Conduct substantially foreclosed competition and generated substantial anticompetitive effects.⁷³¹ Relying heavily on anecdotes, conjecture, and language reminiscent of Zuffa’s promotional materials, as well as other unpersuasive evidence, Dr. Topel asserts that the UFC succeeded by procompetitive means.⁷³² As explained below, this claim is both unpersuasive and irrelevant. It is irrelevant because, even if his evidence of the UFC’s claimed procompetitive conduct were persuasive, Dr. Topel provides no evidence that this claimed procompetitive conduct was driven by the Challenged Conduct. He provides no evidence that the Challenged Conduct was necessary for the UFC or the sport of MMA more generally to succeed.

1. Dr. Topel Relies on Anecdotes, Conjecture, and Other Unpersuasive Evidence to Claim that the UFC Has Succeeded by Procompetitive Means

730. Singer Report ¶287.

731. *Id.* Part III.

732. Topel Report Part III.

228. Dr. Topel's claim that "the UFC is a prime example of the kind of 'superior skill, foresight, and industry' that is the hallmark of vigorous competition"⁷³³ relies heavily on anecdotes and conjecture, and is devoid of economic analysis.⁷³⁴ For example, Dr. Topel points to Dana White's purported contribution to Zuffa's success, such as White's Twitter follower count and his coining of the marketing phrase "As Real As It Gets."⁷³⁵ Dr. Topel's opinion that Zuffa has "expanded the market for MMA by evangelizing it[s] acceptance"⁷³⁶ is similarly devoid of economic content.

229. Dr. Topel also claims that Zuffa "expended significant resources in legitimizing MMA,"⁷³⁷ and that Zuffa's efforts ultimately "led to MMA being sanctioned by state athletic commissions in all 50 states by 2016."⁷³⁸ Although establishing the sequence of events that "legitimized MMA" is not a topic that lends itself to economic analysis, I understand that the rules and regulations governing MMA were already established before Zuffa purchased the UFC, that the UFC's prior owners sought and obtained sanctioning for MMA in several states, and that various MMA publications, journalists, and websites have documented Zuffa's factually incorrect claims in this regard, which are sometimes referred to collectively as the "Zuffa myth."⁷³⁹

733. *Id.* ¶49 (citing Fertitta Dep. at 147).

734. *Id.* ¶¶49-57.

735. *Id.* ¶55.

736. *Id.* ¶21.

737. *Id.* ¶51.

738. *Id.*

739. *See, e.g.*, Letter to CBS News by Nick Lembo, New Jersey Deputy Attorney General and the Counsel to the New Jersey State Athletic Control Board, available at <http://www.mmaweekly.com/new-jersey-commission-corrects-60-minutes-story-2> ("Mr. White did not set up rules and regulations for today's sport known as mixed martial arts. Simply put, the State of New Jersey did. All Mr. White did was follow rules that were already set in place... Mixed martial arts websites and publications...have done extensive articles covering Mr. White's factually incorrect statements, which have come to be known as the 'Zuffa Myth'."). *See also* Jonathan Snowden, "UFC 118 Preview: Dana White Brings Back the Zuffa Myth for an Ignorant Boston Press," *Bloody Elbow* (August 26, 2010) ("Zuffa has long promoted the myth that Semaphore Entertainment Group (SEG), the previous owners of the UFC, ran away from regulation while they ran towards it. White credits himself with cleaning up a dirty sport. The problem: his account is mostly fictional. SEG went to great lengths to get the sport approved in New Jersey and California (where the battle

230. In an attempt to demonstrate that the UFC's success is the result of competition on the merits, Dr. Topel claims that "the history of MMA, both for UFC and for competing promoters, shows that identifying, developing, and promoting talent is the path to success."⁷⁴⁰ Instead of presenting economic analysis to support this proposition, Dr. Topel simply reviews deposition testimony of Dana White taking credit for Conor McGregor's success, and similar claims from other Zuffa executives.⁷⁴¹ Elsewhere in his report, Dr. Topel presents Exhibit 25, which he claims demonstrates that "Zuffa has a strong history of helping athletes develop from a low rank into the Top 15."⁷⁴² But as explained in Part I.A.1 above, Dr. Topel's Exhibit 25 simply confirms that Zuffa's share of the Headliner Submarket has increased over time. Moreover, according to Dr. Topel's own analysis in Exhibit 25, between 21 percent and 49 percent of what Dr. Topel terms "Zuffa Headliner Streaks" during the Class Period involved Fighters who achieved Headliner status *before* they came to Zuffa.⁷⁴³ This indicates that Zuffa, despite having

raged for years). After Campbell McLaren's early marketing based around the sport's brutality backfired, the UFC went into overdrive to change the public perception of the sport. Techniques like head butts had been eliminated long before White came on the scene and eye gouges were never allowed. And even the Unified Rules used to govern MMA today came from the Mixed Martial Arts Council (MMAC) manual created by UFC Commissioner Jeff Blatnick for SEG.").

740. Topel Report ¶61.

741. *Id.* ¶¶61-63, citing Deposition of Dana White, August 9-10, 2017, at 332:17-23 ("Four years ago, Conor McGregor was available to everybody. Bellator, ONE FC, UFC, everybody out there. Do you know who went out – he was – he was 7 and 2. Okay? Guy's record was 7 and 2. There's a zillion of them, right? I went and got Conor McGregor. I saw him, I liked his personality, and I turned him into a star, one of the biggest stars on earth right now."); Silva Dep. at 61:15-23 ("[P]eople simply didn't do that research... I'm not being disingenuous. I really felt that there was talent that was overlooked. That here's the -- the fighters that people are making a big deal about, but I did not necessarily agree that they were that good, where I thought there were good fighters that may have been going under people's radar."); Deposition of Lorenzo Fertitta, March 23, 2017 at 221:13-223: [REDACTED]

742. Topel Report ¶214; *id.* Exhibit 25.

743. *Id.* Exhibit 25, fourth column (displaying "% of Zuffa Headliner Streaks With Non- Headliner Rank at Time of First Ever Zuffa Bout"). This statistic ranges from 51 percent to 79 percent between 2011 and 2017. Therefore, between (1- 79) = 21 percent and (1- 51) = 49 percent of Zuffa Headliner Streaks involved Fighters that achieved Headliner status before coming to Zuffa).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

foreclosed a dominant share of Headliners, still routinely relied on Headliners obtained from other promotions.

231. My own analysis confirms that Zuffa routinely relied on highly ranked Fighters acquired from other MMA promoters, either through horizontal acquisitions or by “poaching” (that is, by signing the Fighter away from another MMA promoter after the Fighter has already begun to achieve prominence). Between January 2001 and June 2017, of the 380 Headliners that have fought for Zuffa, 145 (or 38 percent) *first achieved Headliner status at another MMA promoter*. Over that same period, of the 181 top-five Fighters who have fought for Zuffa, 58 (or 32 percent) first achieved a top-five rank at another MMA promoter. Even during the Class Period (when Zuffa enjoyed a dominant share of the Headliner market), 23 percent of the Headliners who fought for Zuffa first achieved Headliner status at another MMA promoter, and 20 percent of Zuffa’s top-five Fighters first achieved a top five ranking at another MMA promoter.

232. Finally, it bears emphasis that Dr. Topel’s opinion that Zuffa “helped t[urn] the sport of MMA into one of the fastest-growing sports in the world”⁷⁴⁴ is irrelevant as a defense to the Challenged Conduct. In order for it to be relevant, Dr. Topel would need to show that absent the Challenged Conduct—for example, absent the restrictions on Fighter mobility in its contracts—Zuffa would not have invested in the development of MMA or in its Fighters. But nowhere does Dr. Topel make this claim, and nowhere does Dr. Topel even attempt to quantify what effect the Challenged Conduct is purported to have on investments Zuffa made in the sport or its fighters. In the but-for world, Zuffa (and other MMA promoters) would face clear incentives to “evangelize” MMA, just as any profit-maximizing firm has incentives to invest in activities that increase the demand for its product. If anything, the incentive to “evangelize” MMA would be

744. *Id.* ¶57.

greater in a but-for world with more competition, as rival promoters would have a better chance to recoup their investments. The Challenged Conduct is not about Zuffa's investments in MMA generally (or of Fighters specifically). The Challenged Conduct implicates the restraints that Zuffa has put in place to substantially foreclose other MMA promoters, suppress Fighter pay, and harm competition generally. Nowhere does Dr. Topel provide evidence that, absent such competitive restrictions, investments in the sport of MMA or in MMA Fighters would not have occurred.⁷⁴⁵

2. Dr. Topel Admits That the Challenged Conduct Is a Barrier to Entry That Permits Zuffa to Exercise Monopsony Power

233. Consistent with my conclusion that the Challenged Conduct is a barrier to entry and expansion,⁷⁴⁶ Dr. Topel opines that [REDACTED]
[REDACTED],⁷⁴⁷ Dr. Topel opines that [REDACTED]
[REDACTED],⁷⁴⁸ claiming that incentives to invest would be dampened.⁷⁴⁹ As explained in Part V.C, Dr. Topel provides no evidence that the Challenged Conduct increased investment in Fighters or in MMA.

234. My initial report anticipates Dr. Topel's claims regarding investment, which echo the claims of professional sports leagues in the past, attempting to justify labor market restrictions on Fighter mobility by claiming that they are necessary to incentivize investment for the benefit of the sport. My initial report explains that these claims have been contradicted by both the

745. In an attempt to demonstrate that the UFC has procompetitively increased consumer choice, Dr. Topel simply observes that Zuffa has promoted events in, and Fighters from, a variety of locations both inside and outside the United States. *Id.* ¶60. As before, Dr. Topel provides no evidence that this claimed procompetitive benefit is somehow the result of the Challenged Conduct. In the but-for world, Zuffa (and other MMA promoters) would also have incentives to "increase[] the variety of MMA events and athletes available to U.S. consumers." *Id.* If anything, these incentives would be greater in a but-for world with more competition.

746. Singer Report Part III.A.7.

747. Topel Report ¶68.

748. *Id.*

749. *Id.*

experience of free agency in other professional sports leagues and numerous studies from the sports economics literature.⁷⁵⁰ Far from harming the industry, the increased competition that would prevail in a but-for world without the Challenged Conduct would be expected to benefit Fighters, fans, and the industry as a whole.⁷⁵¹ Again, neither Dr. Topel nor any of Zuffa's economists make any attempt to rebut this evidence. Further, Dr. Blair concedes that suppressing athlete compensation below MRP would have a negative impact on a sport.⁷⁵²

C. That Other MMA Promoters' Contracts With Fighters Were Sometimes Similar to Zuffa's Does Not Demonstrate that the Challenged Contracts Were Procompetitive

235. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

750. Singer Report ¶¶286-290.

751. *Id.*

752. Blair Dep. at 148:24-149:5 ("the quality of the play would be lower and that ... in turn, could have an impact on fan demand for watching major league games and ... to that extent, the value of the product that's being offered, that is the competition of the field ... is lower and consumers are worse off as a result").

753. [REDACTED]

[REDACTED]

754. See, e.g., A. Douglas Melamed, *Exclusionary Conduct under the Antitrust Laws: Balancing, Sacrifice, and Refusals to Deal*, 20(2) BERKELEY TECH. L. J. 1248-66, 54 (March 2005) ("The likelihood that, and extent to which, exclusionary conduct will weaken or exclude rivals often depends a great deal on how the rival responds to the conduct-on whether he responds creatively, efficiently, and effectively in the marketplace. But if the determination over whether a defendant's conduct is anticompetitive depends in large part on the impact of the conduct on the defendant's rivals and their customers, the incentive of the rivals to respond to suspected exclusionary conduct by aggressive and creative marketplace conduct of their own will be diminished."), available at <http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1579&context=btlj> Dr. Blair testified that firms in the competitive fringe will match the contract terms imposed by a monopsonist, just as they will match the anticompetitive suppressed price paid by the monopsonist. See Blair Dep. at 112:25-115:6 ("Q. Does the same logic of [the umbrella pricing] model apply ... to non-price transactional terms such as who bears the risk of injury, for example? A. ... [W]hen we start to talk about some of these terms ... one would expect ... maybe not initially, but you would expect

[REDACTED]

1. The Challenged Conduct Incentivized Other MMA Promoters to Adopt Fighter Contracts Similar to Zuffa's "Industry Standard," and Rivals' Contracts Were Less Restrictive Than Zuffa's In Practice

236 [REDACTED]

[REDACTED]

the terms to wind up being roughly the same ... in a market ... just through adjustments over time as you move to an equilibrium.").

755. Coker Dep. at 245:14-246:9.

756. [REDACTED]

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

237. Dr. Topel opines that, if the Challenged Conduct were not procompetitive, then MMA promoters such as Bellator “could make a more attractive offer to athletes by offering shorter and less restrictive contracts, and use that as a competitive advantage relative to UFC.”⁷⁶²

757. Singer Report ¶107, ¶¶135-136.

758. *Id.*

759. Aronson Dep. at 60:6-61:9 (“RFA [Resurrection Fighting Alliance] has borrowed fighters from me and I’ve borrowed fighters from them. It’s been a reciprocal, mutually beneficial relationship ... Q. Did RFA borrow fighters from Titan? A. Um-hum. Q. And vice versa? A. Yes. Q. What does it mean to borrow a fighter? A. In other words, if RFA needed a fighter for a weight class, and I was in the middle of doing a show and didn’t have a fight for that fighter until the next show, I would allow RFA to use one of my fighters, and if they had the same situation they would allow me to borrow one of their fighters. Q. Would you describe that as a mutually beneficial relationship? A. Sure. And beneficial for the fighter, because it keeps them busy and gets them a paycheck and hopefully gets them another win.”).

760. Deposition of Kurt Otto, February 6, 2017, 328:21-329:12 (“... while they were with the IFL, those athletes could not go and compete for another MMA promotion; is that right? A. Typically not. They’re under contract, but if there was some specific thing -- an example, let’s say that you had a fighter under contract, and the coach preferred putting in -- a better fighter in that person’s spot that once had a starting position, but that person wasn’t starting any longer and he was under contract, we would work with the coach to let that person generate revenue maybe at another fight organization and allow them to fight.”).

761. *Id.* at 128:16-129:4 (“Q. Yes. Did you ever, in promoting IFL fights, use former videos of your fighters of prior fights? A. With the UFC content? Q. First of all, just generally. A. Yes. Other organizations gave us content. Not the UFC, other organizations gave us content to use for our reels. Absolutely. Q. To promote your fights? A. Yes. And, interestingly enough, the UFC has used IFL content to promote their fighters.”).

762. Topel Report ¶114.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

This ignores Zuffa's first-mover advantage, which Dr. Topel himself concedes.⁷⁶³ Given that (due at least in part to the Challenged Conduct) the UFC is the dominant destination for other Fighters, and given that Zuffa's Fighters are bound to Zuffa due to the Challenged Conduct, MMA promoters such as Bellator clearly cannot gain a significant competitive advantage by unilaterally offering shorter and less restrictive contracts. Doing so would simply give Zuffa more and better opportunities to sign away promising Fighters, while simultaneously failing to lure away Fighters bound to Zuffa by the Challenged Conduct. Economists have demonstrated in other contexts that it does not make economic sense for competitors to unilaterally "take the high road."⁷⁶⁴

2. Dr. Topel Assumes Incorrectly That Conduct Undertaken by a Non-Dominant Firm Is Necessarily Procompetitive When Practiced By a Dominant Firm

238. Dr. Topel's defense of the Challenged Conduct assumes (without citation to any authority) that conduct undertaken by a firm without significant market power is necessarily procompetitive when undertaken by a firm with significant market power.⁷⁶⁵ This assumption is wrong. Economists and antitrust scholars recognize that conduct is examined through a "special lens" when a firm has significant market power:

Where a defendant maintains substantial market power, his activities are examined through a special lens: Behavior that might otherwise not be of concern to the antitrust law—or that might even be viewed as procompetitive—can take on exclusionary connotations when practiced by a monopolist.⁷⁶⁶

763. Topel Dep. at 442:10-14; Topel Report ¶96.

764. See, e.g., Xavier Gabaix & David Laibson, *Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets*, 121 Q.J. ECON. 505 (2006) (showing that firms would find it more profitable to pursue a pricing strategy that exploited myopic consumers with higher prices than to attempt to steal customers from one another by slashing prices of ancillary services, even in "highly competitive markets.").

765. Topel Report ¶84 ("The use of such provisions by entities that could not plausibly possess monopsony power...indicates that the provisions in these contracts have a procompetitive purpose."). See also ¶¶80-84, ¶117.

766. *Eastman Kodak Co. v. Image Technical Servs.*, 504 U.S. 451, 483 & n.32 (1992) (citing P. Areeda & D. Turner, ANTITRUST LAW ¶ 813, pp. 300-302 (1978)); see also Einer Elhauge, *Defining Better Monopolization Standards*, 56 STAN. L.R. 172 (2003) [hereafter, "Elhauge"].

Accordingly, the “usual caveat”⁷⁶⁷ when analyzing exclusionary conduct is to recognize that:

[E]ven where the conduct by a competitive firm is determined to be procompetitive, that showing alone does not imply that the same conduct by a dominant firm would be procompetitive.⁷⁶⁸

Among competitive firms, exclusive contracts may have various procompetitive benefits; they may increase price competition among suppliers, reduce risk by guaranteeing a source of inputs, and provide incentives to provide better products and service.⁷⁶⁹ Exclusive dealing is therefore less likely to be anticompetitive whenever there is “competition among a number of relatively equal competitors each with its own exclusives, and no coordination[.]”⁷⁷⁰ Therefore, a threshold condition for establishing that the Challenged Conduct is anticompetitive is to prove that Zuffa has significant market power, as explained (and demonstrated) in my initial report.⁷⁷¹

239. As a consequence, to the extent that other MMA promoters did engage (however unsuccessfully) in contracting practices similar to the challenged contractual provisions, that would provide no economic justification for those provisions. If anything, competitive options for Fighters, and competition generally, would be further harmed when Zuffa’s restrictive contracting practices are mimicked by other MMA promoters.⁷⁷²

3. Multi-Bout Exclusive Contracts Could Remain in the But-For World, Despite Dr. Topel’s Straw-Man Attacks

240. My initial report explained that Zuffa has previously put forth a straw-man defense of multi-fight contracts, and that this assumes incorrectly that the only alternative to the

767. Salop (2017) at 374, n. 10 .

768. *Id.*

769. *Id.* at 395-396.

770. *Id.* at 396. The use of exclusive contracts among non-dominant firms can harm competition under certain conditions. For example, “parallel exclusion by multiple firms can lead to anticompetitive coordination.” *Id.* at 374.

771. Singer Report ¶5; *id.* Parts III.A-B.

772. *Id.* ¶263.

Challenged Conduct would be single-bout contracts.⁷⁷³ But the controversy here is not the existence of multi-fight contracts *per se*, but instead whether the *degree* of the restrictions contained in Zuffa's contracts (given Zuffa's monopsony power), the term of the restrictions, and the practices Zuffa uses to maintain its monopsony power, are sufficiently high so as to generate anticompetitive effects that outweigh any possible procompetitive benefits.⁷⁷⁴ My initial report shows that to be the case.⁷⁷⁵

241. Dr. Topel resurrects this straw-man argument, implying incorrectly that eliminating the Challenged Conduct is equivalent to eliminating all multi-bout contracts.⁷⁷⁶ Dr. Topel also provides no evidence to support the notion that competition would be harmed if Zuffa Fighters were subject to less restrictive contracts of shorter duration. Dr. Topel states that Zuffa [REDACTED] [REDACTED]⁷⁷⁷ but does not explain how this would justify the contractual duration of exclusivity encompassed by the Challenged Conduct (which exceeds 30 months even if one ignores contract renewals and extensions). Dr. Topel emphasizes the benefits to Zuffa of longer durations of exclusivity, but fails to balance those supposed benefits to Zuffa against the cost to Fighters, and to competition more generally. In his deposition, Dr. Topel admitted that it would not be procompetitive for Zuffa to lock up Fighters in perpetuity because "Zuffa would capture the entire returns to their human capital investments."⁷⁷⁸ By the same logic, the Challenged Conduct allows Zuffa to capture more of the returns to Fighters' human capital than in the but-for world.

773. *Id.* ¶264.

774. *Id.*; *see also id.* ¶¶282-283.

775. *Id.* Part III.C.

776. Topel Report ¶¶93-94, ¶113.

777. *Id.* ¶93.

778. Topel Dep at 291:16-25.

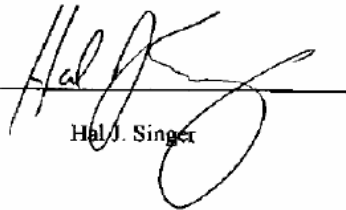
-178-

This is effectively an admission that at some contract duration, the social costs and costs to Fighters of decreased Fighter mobility exceed the private benefits to Zuffa.

CONCLUSION

242. For the foregoing reasons, Zuffa's expert witnesses fail to undermine any of the conclusions of my initial report, and in several instances either concede key underpinnings of my analyses or do not attempt to rebut them at all.

* * *



Hal J. Singer

Executed on January 12, 2018.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

APPENDIX: CV

Office Address

Economists Incorporated
2121 K Street, NW
Suite 1100
Washington, DC 20037
Phone: (202) 747-3520
singer.h@ei.com

Education

Ph.D., The John Hopkins University, 1999; M.A. 1996, Economics

B.S., Tulane University, *magna cum laude*, 1994, Economics. Dean's Honor Scholar (full academic scholarship). Senior Scholar Prize in Economics.

Current Position

ECONOMISTS INCORPORATED, Washington, D.C.: Principal 2014-present.

GEORGETOWN UNIVERSITY, MCDONOUGH SCHOOL OF BUSINESS, Washington, D.C.: Adjunct Professor 2010, 2014, 2016, 2018.

GEORGE WASHINGTON UNIVERSITY, SCHOOL OF PUBLIC POLICY, GEORGE WASHINGTON INSTITUTE FOR PUBLIC POLICY, Washington, D.C.: Senior Fellow 2016-present.

Employment History

NAVIGANT ECONOMICS, Washington, D.C.: Managing Director, 2010-2013.

EMPIRIS, L.L.C., Washington, D.C.: Managing Partner and President, 2008-2010.

CRITERION ECONOMICS, L.L.C., Washington, D.C.: President, 2004-2008. Senior Vice President, 1999-2004.

LECG, INC., Washington, D.C.: Senior Economist, 1998-99.

U.S. SECURITIES AND EXCHANGE COMMISSION, OFFICE OF ECONOMIC ANALYSIS, Washington, D.C.: Staff Economist, 1997-98.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

THE JOHNS HOPKINS UNIVERSITY, ECONOMICS
DEPARTMENT, Baltimore: Teaching Assistant, 1996-98.

Authored Books and Book Chapters

Do Municipal Broadband Networks Stimulate or Crowd Out Private Investment? An Empirical Analysis of Employment Effects, in THE IMPACT OF THE INTERNET ON JOBS (Lorenzo Pupillo, ed. Palgrave 2017).

THE NEED FOR SPEED: A NEW FRAMEWORK FOR
TELECOMMUNICATIONS POLICY FOR THE 21ST CENTURY,
co-authored with Robert Litan (Brookings Press 2013).

Net Neutrality Is Bad Broadband Regulation, co-authored with
Robert Litan, in THE ECONOMISTS' VOICE 2.0: THE
FINANCIAL CRISIS, HEALTH CARE REFORM AND MORE
(Aaron Edlin and Joseph Stiglitz, eds., Columbia University Press
2012).

Valuing Life Settlements as a Real Option, co-authored with Joseph
R. Mason, in LONGEVITY TRADING AND LIFE
SETTLEMENTS (Vishaal Bhuyan ed., John Wiley & Sons 2009).

*An Antitrust Analysis of the World Trade Organization's Decision in
the U.S.-Mexico Arbitration on Telecommunications Services*, co-
authored with J. Gregory Sidak, in HANDBOOK OF TRANS-
ATLANTIC ANTITRUST (Philip Marsden, ed. Edward Elgar
2006).

BROADBAND IN EUROPE: HOW BRUSSELS CAN WIRE THE
INFORMATION SOCIETY, co-authored with Dan Maldoom,
Richard Marsden and J. Gregory Sidak (Kluwer/Springer Press
2005).

*Are Vertically Integrated DSL Providers Squeezing Unaffiliated ISPs
(and Should We Care)?*, co-authored with Robert W. Crandall, in
ACCESS PRICING: THEORY, PRACTICE AND EMPIRICAL
EVIDENCE (Justus Haucap and Ralf Dewenter eds., Elsevier Press
2005).

Journal Articles

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Paid Prioritization and Zero Rating: Why Antitrust Cannot Reach the Part of Net Neutrality Everyone Is Concerned About, ANTITRUST SOURCE (2017).

The Curious Absence of Economic Analysis at the Federal Communications Commission: An Agency in Search of a Mission, INTERNATIONAL JOURNAL OF COMMUNICATIONS (2017), co-authored with Gerald Faulhaber and Augustus Urschel.

On the Utility of Surrogates for Rule of Reason Cases, COMPETITION POLICY INTERNATIONAL (2015), co-authored with Kevin Caves.

Analyzing High-Tech Employee: The Dos and Don'ts of Proving (and Disproving) Classwide Antitrust Impact in Wage Suppression Cases, ANTITRUST SOURCE (2015), co-authored with Kevin Caves.

Econometric Tests for Analyzing Common Impact, 26 RESEARCH IN LAW AND ECONOMICS (2014), co-authored with Kevin Caves.

Life After Comcast: The Economist's Obligation to Decompose Damages Across Theories of Harm, ANTITRUST (Spring 2014), co-authored with Kevin Caves.

Is the U.S. Government's Internet Policy Broken?, 5 POLICY AND INTERNET (2013), co-authored with Robert Hahn.

Avoiding Rent-Seeking in Secondary Market Spectrum Transactions, 65 FEDERAL COMMUNICATIONS LAW JOURNAL (2013), co-authored with Jeffrey Eisenach.

Vertical Integration in Multichannel Television Markets: A Study of Regional Sports Networks, 12(1) REVIEW OF NETWORK ECONOMICS (2013), co-authored with Kevin Caves and Chris Holt.

Assessing Bundled and Share-Based Loyalty Rebates: Application to the Pharmaceutical Industry, 8(4) JOURNAL OF COMPETITION LAW AND ECONOMICS (2012), co-authored with Kevin Caves.

Lessons from Kahneman's Thinking Fast and Slow: Does Behavioral Economics Have a Role in Antitrust Analysis?, The ANTITRUST SOURCE (2012), co-authored with Andrew Card.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Assessing Competition in U.S. Wireless Markets: Review of the FCC's Competition Reports, 64 FEDERAL COMMUNICATIONS LAW JOURNAL (2012), co-authored with Gerald Faulhaber and Robert Hahn.

An Empirical Analysis of Aftermarket Transactions by Hospitals, 28 JOURNAL OF CONTEMPORARY HEALTH LAW AND POLICY (2011), co-authored with Robert Litan and Anna Birkenbach.

Economic Evidence of Common Impact for Class Certification in Antitrust Cases: A Two-Step Analysis, ANTITRUST (Summer 2011).

Addressing the Next Wave of Internet Regulation: Toward a Workable Principle for Nondiscrimination, 4 REGULATION & GOVERNANCE (2010), co-authored with Robert Hahn and Robert Litan.

Class Certification in Antitrust Cases: An Economic Framework, 17 GEORGE MASON LAW REVIEW (2010), co-authored with Robert Kulick.

The Economic Impact of Eliminating Preemption of State Consumer Protection Laws, 12 UNIVERSITY OF PENNSYLVANIA JOURNAL OF BUSINESS LAW 781 (2010), co-authored with Joseph R. Mason and Robert B. Kulick.

Net Neutrality Is Bad Broadband Regulation, THE ECONOMISTS' VOICE, Sept. 2010, co-authored with Robert Litan.

Why the iPhone Won't Last Forever and What the Government Should Do to Promote its Successor, 8 JOURNAL ON TELECOMMUNICATIONS AND HIGH TECHNOLOGY LAW 313 (2010), co-authored with Robert W. Hahn.

What Does an Economist Have to Say About the Calculation of Reasonable Royalties?, 14 INTELLECTUAL PROPERTY LAW BULLETIN 7 (2010), co-authored with Kyle Smith.

Is Greater Price Transparency Needed in the Medical Device Industry?, HEALTH AFFAIRS (2008), co-authored with Robert W. Hahn and Keith Klovers.

Evaluating Market Power with Two-Sided Demand and Preemptive Offers to Dissipate Monopoly Rent, 4 JOURNAL OF

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

COMPETITION LAW & ECONOMICS (2008), co-authored with J. Gregory Sidak.

Assessing Bias in Patent Infringement Cases: A Review of International Trade Commission Decisions, 21 HARVARD JOURNAL OF LAW AND TECHNOLOGY (2008), co-authored with Robert W. Hahn.

The Effect of Incumbent Bidding in Set-Aside Auctions: An Analysis of Prices in the Closed and Open Segments of FCC Auction 35, 32 TELECOMMUNICATIONS POLICY JOURNAL (2008), co-authored with Peter Cramton and Allan Ingraham.

A Real-Option Approach to Valuing Life Settlement Transactions, 23 JOURNAL OF FINANCIAL TRANSFORMATION (2008), co-authored with Joseph R. Mason.

The Economics of Wireless Net Neutrality, 3 JOURNAL OF COMPETITION LAW AND ECONOMICS 399 (2007), co-authored with Robert W. Hahn and Robert E Litan.

Vertical Foreclosure in Video Programming Markets: Implication for Cable Operators, 3 REVIEW OF NETWORK ECONOMICS 348 (2007), co-authored with J. Gregory Sidak.

The Unintended Consequences of Net Neutrality, 5 JOURNAL ON TELECOMMUNICATIONS AND HIGH TECH LAW 533 (2007), co-authored with Robert E. Litan.

Does Video Delivered Over a Telephone Network Require a Cable Franchise?, 59 FEDERAL COMMUNICATIONS LAW JOURNAL 251 (2007), co-authored with Robert W. Crandall and J. Gregory Sidak.

The Competitive Effects of a Cable Television Operator's Refusal to Carry DSL Advertising, 2 JOURNAL OF COMPETITION LAW AND ECONOMICS 301 (2006).

Überregulation without Economics: The World Trade Organization's Decision in the U.S.-Mexico Arbitration on Telecommunications Services, 57 FEDERAL COMMUNICATIONS LAW JOURNAL 1 (2004), co-authored with J. Gregory Sidak.

The Secondary Market for Life Insurance Policies: Uncovering Life Insurance's "Hidden" Value, 6 MARQUETTE ELDER'S

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

ADVISOR 95 (2004), co-authored with Neil A. Doherty and Brian A. O'Dea.

Do Unbundling Policies Discourage CLEC Facilities-Based Investment?, 4 TOPICS IN ECONOMIC ANALYSIS AND POLICY (2004), co-authored with Robert W. Crandall and Allan T. Ingraham.

Foreign Investment Restrictions as Industrial Policy, 3 CANADIAN JOURNAL OF LAW AND TECHNOLOGY 19 (2004), co-authored with Robert W. Crandall.

Regulating the Secondary Market for Life Insurance Policies, 21 JOURNAL OF INSURANCE REGULATION 63 (2003), co-authored with Neil A. Doherty.

Interim Pricing of Local Loop Unbundling in Ireland: Epilogue, 4 JOURNAL OF NETWORK INDUSTRIES 119 (2003), co-authored with J. Gregory Sidak.

The Benefits of a Secondary Market for Life Insurance, 38 REAL PROPERTY, PROBATE AND TRUST JOURNAL 449 (2003), co-authored with Neil A. Doherty.

The Empirical Case Against Asymmetric Regulation of Broadband Internet Access, 17 BERKELEY TECHNOLOGY LAW JOURNAL 954 (2002), co-authored with Robert W. Crandall and J. Gregory Sidak.

How Can Regulators Set Nonarbitrary Interim Rates? The Case of Local Loop Unbundling in Ireland, 3 JOURNAL OF NETWORK INDUSTRIES 273 (2002), co-authored with J. Gregory Sidak.

Vertical Foreclosure in Broadband Access, 49 JOURNAL OF INDUSTRIAL ECONOMICS (2001) 299, co-authored with Daniel L. Rubinfeld.

Open Access to Broadband Networks: A Case Study of the AOL/Time Warner Merger, 16 BERKELEY TECHNOLOGY LAW JOURNAL 640 (2001), co-authored with Daniel L. Rubinfeld.

Cable Modems and DSL: Broadband Internet Access for Residential Customers, 91 AMERICAN ECONOMICS ASSOCIATION PAPERS AND PROCEEDINGS 302 (2001), co-authored with Jerry A. Hausman and J. Gregory Sidak.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Residential Demand for Broadband Telecommunications and Consumer Access to Unaffiliated Internet Content Providers, 18 YALE JOURNAL ON REGULATION 1 (2001), co-authored with Jerry A. Hausman and J. Gregory Sidak.

Determining the Source of Inter-License Synergies in Two-Way Paging Networks, 18 JOURNAL OF REGULATORY ECONOMICS 59 (2000).

A General Framework for Competitive Analysis in the Wireless Industry, 50 HASTINGS LAW REVIEW 1639 (2000), co-authored with J. Gregory Sidak and David Teece.

Capital Raising in Offshore Markets, 23 JOURNAL OF BUSINESS AND FINANCE 1181 (1999), co-authored with Ian Gray and Reena Aggarwal.

Expert Testimony Since 2012

The Ohio State University v. New Par D/B/A Verizon Wireless, Case No. 2:15-cv-2866 (S.D. Oh.).

Authenticom, Inc. v. CDK Global, LLL; and The Reynolds And Reynolds Company, Case No. 17-cv-318 (W.D. Wis.).

Manmohan Dhillon et al. v. Anheuser-Busch, LLC et al. Case No. 14CECG03039 MBS (Cal. Fresno).

In re Lidoderm Antitrust Litigation, MDL Dkt. No. 14-md-02521-WHO (N.D. Cal.).

Maxon Hyundai Mazda et al. v. Carfax Inc., Case No. CV 2680 (AJN) (RLE) (S.D. N.Y.).

Philip R. Loy and Sharon Loy v. Womble Carlyle Sandridge & Rice, et al., Case No. 2014-cv-254012 (Ga. Super.).

In re MyFord Touch Consumer Litigation, Case No. 13-cv-3072-EMC (N.D. Cal.).

Sun Life Assurance Company of Canada v. U.S. Bank National Association, Case No. NO. 2:14-cv-04703-SJF-GRB (E.D. N.Y.).

Sun Life Assurance Company of Canada v. U.S. Bank National Association and Larry Bryan, Case No. 14-CIV-62610-BLOOM/VALLE (S.D. Fla.).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

In the Matter of Flat Wireless, LLC, for and on behalf of its Operating Subsidiaries, v. Cellco Partnership d/b/a Verizon Wireless, and its Operating Subsidiaries, File No. EB-15-MD-005 (Federal Communications Commission).

Omni Healthcare et al. v. Health First Inc. et al, Case No. 6:13-CV-01509-RBD-DAB (M.D. Fla.).

Schuylkill Health System et al. v. Cardinal Health 200, LLC & Owens & Minor Distribution, Inc., Case No. 12-cv-07065-JS (E.D. Pa.).

Meda Pharmaceuticals Inc. v. Apotex, Inc and Apotex Corp., Case No. 01-14-0001-6315 (Am. Arbitration Ass'n).

Mark S. Wallach, et al v. Eaton Corporation, et al, Case No. 10-260-SLR (D. Del.).

STB Ex Parte No. 722 Railroad Revenue Adequacy (Surface Transportation Board).

In the Matter of 2014 Quadrennial Regulatory Review – Review of the Commission’s Broadcast Ownership Rules and Other Rules Adopted Pursuant to Section 202 of the Telecommunications Act of 1996, MB Docket No. 14-50 (Federal Communications Commission).

Lindsay Kamakahi and Justine Levy, et al v. American Society for Reproductive Medicine and Society for Assisted Reproductive Technology, Case No.: 3:11-CV-1781 JCS (N.D. Cal.).

Salud Services, Inc. et al v. Caterpillar, Inc., Case No.: 1:12-cv-23927 (S.D. Fla.).

Gnanh Nora Krouch v. Wal-Mart Stores, Inc., Case No. CV-12-2217 (N.D. Cal.).

In the Matter of Petition for Rulemaking to Eliminate the Sports Blackout Rule, MB Docket No. 12-3 (Federal Communications Commission).

In the Matter of Review of Wholesale Services and Associated Policies, File No. 8663-C12-201313601 (Canadian Radio-Television and Telecommunications Commission).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Crafting a Successful Incentive Auction: Stakeholders' Perspectives (U.S. Senate, Committee on Commerce, Science, and Transportation).

Altergy Systems v. Enersys Delaware, Inc., Case No. 74-198-Y-001772-12 JMLE (American Arbitration Association).

In re New York City Bus Tour Antitrust Litigation, Master Case File No. 13-CV-0711 (S.D. N.Y.).

SOCAN Tariff 22.A (Online Music Services, 2011-2013), CSI Online Music Services (2011-2013), SODRAC Tariff 6 - Online Music Services, Music Videos (2010-2013) (Copyright Board Canada).

Imperial Premium Finance, LLC, v. Sun Life Assurance Company of Canada (S.D. Fla.).

The Satellite Television Law: Repeal, Reauthorize, or Revise? (U.S. House of Representatives, Committee on Energy and Commerce).

Marchbanks Truck Service, et al. v. Comdata Network Inc., et al., Civil Action No. 07-1078-JKG (E.D. Pa.).

Patricia Reiter v. Mutual Credit Corporation, et al., Case No. 8:09-cv-0081 AG (RNBx) (C.D. Cal.).

In re Photochromic Lens Antitrust Litigation, MDL Docket No. 2173 (M.D. Fla.).

In the Matter of the Arbitration Between Washington Nationals Baseball Club v. TCR Sports Broadcasting Holdings, L.L.P. (Major League Baseball Revenue Sharing Definitions Committee).

Miguel V. Pro and Davis Landscape et al. v. Hertz Equipment Rental Corporation, No. 2:06-CV-3830 (DMC) (D.N.J.).

Game Show Network, LLC v. Cablevision Systems Corp., File No. CSR-8529-P (Federal Communications Commission).

Apotex, Inc., v. Cephalon, Inc., Barr Laboratories, Inc., Mylan Laboratories, Inc., Teva Pharmaceutical Industries, Ltd., Teva Pharmaceuticals USA, Inc., Ranbaxy Laboratories, Ltd., and Ranbaxy Pharmaceuticals, Inc., Case No. 2:06-cv-02768-MSG (E.D. Pa.).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

In Re Airline Baggage Fee Antitrust Litigation, Civil Action No. 1:09-Md-2089-Tcb (N.D. Ga.).

White Papers

“Assessing the Impact of Removing Regulatory Barriers on Next Generation Wireless and Wireline Broadband Infrastructure Investment” (prepared for Corning Inc.), co-authored with Ed Naef (June 16, 2017).

“An Economic Analysis of the FCC’s Eight Voices Rule” (prepared for the National Association of Broadcasters), co-authored with Kevin Caves (July 20, 2016).

“Assessing the Consequences of Additional FCC Regulations of Business Broadband: An Empirical Analysis,” (prepared for USTelecom) (April 12, 2016).

The Empirical Link Between Fibre-to-the-Premises Deployment and Employment: A Case Study in Canada (prepared for Bell Canada), co-authored with Kevin Caves and Anna Koyfman (Dec. 10, 2015).

Good Intentions Gone Wrong: The Yet-To-Be- Recognized Costs of the Department Of Labor’s Proposed Fiduciary Rule (prepared for Capital Group), co-authored with Robert Litan (July 2015).

Bringing Sanity Back to the Spectrum Debate: A Response to CCA’s White Paper (prepared for Mobile Future), co-authored with Allan Ingraham (June 26, 2015).

Unlocking Patents: Costs of Failure, Benefits of Success (prepared for Patent Utility) (Feb. 4, 2015).

The Consumer Benefits of Efficient Mobile Number Portability Administration (prepared for Neustar) (Mar. 8, 2013).

Economic Analysis of the Implications of Implementing EPA’s Tier 3 Rules (prepared for Emissions Control Technology Association), co-authored with George Schink (June 14, 2012).

Are Google’s Search Results Unfair or Deceptive Under Section 5 of the FTC Act? (prepared for Google), co- authored with Robert Litan (May 1, 2012).

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Bundles in the Pharmaceutical Industry: A Case Study of Pediatric Vaccines (prepared for Novartis), co-authored with Kevin Caves (July 13, 2011).

Are U.S. Wireless Markets Effectively Competitive? A Critique of the FCC's 14th and 15th Annual Wireless Competition Reports (prepared for AT&T), co-authored with Gerald R. Faulhaber, Robert W. Hahn (July 11, 2011).

Do Group Purchasing Organizations Achieve the Best Prices for Member Hospitals? An Empirical Analysis of Aftermarket Transactions (prepared for Medical Device Manufacturers Association), co-authored with Robert Litan (Oct. 6, 2010).

The Economic Impact of Broadband Investment (prepared for Broadband for America), co-authored with Robert Crandall (Feb. 23, 2010).

Why the iPhone Won't Last Forever and What the Government Should Do to Promote Its Successor (prepared for Mobile Future), co-authored with Robert Hahn (Sept. 21, 2009).

The Economic Impact of Eliminating Preemption of State Consumer Protection Laws (prepared for the American Bankers' Association), co-authored with Joseph R. Mason (Aug. 21, 2009).

Economic Effects of Tax Incentives for Broadband Infrastructure Deployment (prepared for the Fiber to the Home Council), co-authored with Jeffrey Eisenach and Jeffrey West (Dec. 23, 2008).

The Effect of Brokered Deposits and Asset Growth on the Likelihood of Failure (prepared for Morgan Stanley, Citigroup, and UBS), co-authored with Joseph Mason and Jeffrey West (Dec. 17, 2008).

Estimating the Benefits and Costs of M2Z's Proposal: Reply to Wilkie's *Spectrum Auctions Are Not a Panacea* (prepared for CTIA), co-authored with Robert W. Hahn, Allan T. Ingraham and J. Gregory Sidak (July 23, 2008).

Irrational Expectations: Can a Regulator Credibly Commit to Removing an Unbundling Obligation? AEI-Brookings Related Publication No. 07-28, co-authored with Jeffrey Eisenach (Dec. 30, 2007)

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Is Greater Price Transparency Needed in The Medical Device Industry? (prepared for Advanced Medical Technology Association), co-authored with Robert W. Hahn (Nov. 30, 2007).

Should the FCC Depart from More than a Decade of Market-Oriented Spectrum Policy? Reply to Skrzypacz and Wilson (prepared for CTIA), co-authored with Gerald Faulhaber and Robert W. Hahn (Jun. 18, 2007).

Improving Public Safety Communications: An Analysis of Alternative Approaches (prepared for the Consumer Electronics Association and the High Tech DTV Coalition), co-authored with Peter Cramton, Thomas S. Dombrowsky, Jr., Jeffrey A. Eisenach, and Allan Ingraham (Feb. 6, 2007).

The Budgetary Impact of Eliminating the GPOs' Safe Harbor Exemption from the Anti-Kickback Statute of the Social Security Act (prepared for the Medical Device Manufacturers Association) (Dec. 20, 2005).

Reply to "The Life Settlements Market: An Actuarial Perspective on Consumer Economic Value" (prepared for Coventry First), co-authored with Eric Stallard (Nov. 15, 2005).

The Competitive Effects of Telephone Entry into Video Markets (prepared for the Internet Innovation Alliance), co-authored with Robert W. Crandall and J. Gregory Sidak (Nov. 9, 2005).

How Do Consumers and the Auto Industry Respond to Changes in Exhaust Emission and Fuel Economy Standards? A Critique of Burke, Abeles, and Chen (prepared for General Motors Corp.), co-authored with Robert W. Crandall and Allan T. Ingraham (Sept. 21, 2004).

Inter-City Competition for Retail Trade in North Texas: Can a TIF Generate Incremental Tax Receipts for the City of Dallas? (prepared for Harvest Partners), co-authored with Thomas G. Thibodeau and Allan T. Ingraham (July 16, 2004).

An Accurate Scorecard of the Telecommunications Act of 1996: Rejoinder to the Phoenix Center Study No. 7 (prepared for BellSouth), co-authored with Robert Crandall (Jan. 6, 2004).

Competition in Broadband Provision and Implications for Regulatory Policy (prepared for the Alcatel, British Telecom, Deutsche Telekom, Ericsson, France Telecom, Siemens, Telefónica

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

de España, and Telecom Italia), co-authored with Dan Maldoom, Richard Marsden, and Gregory Sidak (Oct. 15, 2003).

The Effect of Ubiquitous Broadband Adoption on Investment, Jobs, and the U.S. Economy (prepared for Verizon), co-authored with Robert W. Crandall (Sept. 17, 2003).

The Deleterious Effect of Extending the Unbundling Regime on Telecommunications Investment (prepared for BellSouth), co-authored with Robert W. Crandall (July 10, 2003).

Letter Concerning Spectrum Auction 35 to the Honorable Michael K. Powell, Chairman, Federal Communications Commission, from Peter C. Cramton, Robert W. Crandall, Robert W. Hahn, Robert G. Harris, Jerry A. Hausman, Thomas W. Hazlett, Douglas G. Lichtman, Paul W. MacAvoy, Paul R. Milgrom, Richard Schmalensee, J. Gregory Sidak, Hal J. Singer, Vernon L. Smith, William Taylor, and David J. Teece (Aug. 16, 2002).

Speaking Engagements

Antitrust and Telecommunications, ABA ANTITRUST IN THE AMERICAS, Mexico City, June 1, 2017.

Fundamentals—Economics, ABA SECTION OF ANTITRUST LAW SPRING MEETING, Washington D.C., Mar. 29, 2017.

DOL Rule Analysis and FSR's SIMPLE PTE Explained, FINANCIAL SERVICES ROUNDTABLE, Washington, D.C., Aug. 6, 2015.

New Principles for a Progressive Broadband Policy, PROGRESSIVE POLICY INSTITUTE, Washington, D.C., Mar. 13, 2014.

The Open Internet: Where Do We Go From Here? PROGRESSIVE POLICY INSTITUTE, Washington, D.C., Jan. 29, 2014.

Does Platform Competition Render Common Carriage Irrelevant in an IP world? PROGRESSIVE POLICY INSTITUTE, Washington, D.C. Nov. 20, 2013.

The 41st Research Conference on Communication, Information and Internet Policy, TELECOMMUNICATIONS POLICY RESEARCH CONFERENCE, George Mason University School of Law, Arlington, VA, September 27, 2013.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

The Broadband Technology Explosion: Rethinking Communications Policy for a Mobile Broadband World, Pepperdine School of Public Policy, Menlo Park, CA. June 20, 2013.

Net Neutrality: Government Overreach or the Key to Innovation?, NORTHWESTERN JOURNAL OF TECHNOLOGY AND INTELLECTUAL PROPERTY EIGHTH ANNUAL SYMPOSIUM, Chicago, IL., Mar. 8, 2013.

Internet Everywhere: Broadband as a Catalyst for the Digital Economy, The Brookings Institution, Washington, D.C., Nov. 27, 2012.

Can Broadband Power an Economic Recovery?, Advanced Communications Law & Policy Institute at New York Law School, Washington, D.C., July 10, 2012.

Using Regression in Antitrust Cases, UNIVERSITY OF PENNSYLVANIA LAW SCHOOL, Philadelphia, PA., April 12, 2012.

Mergers: The Road to Duopoly or Path to Competitive Panacea? NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS, Los Angeles, CA., July 20, 2011.

State of the Mobile Net, CONGRESSIONAL INTERNET CAUCUS, Washington, D.C., May 27, 2011.

Waves of Innovation: Spectrum Allocation in the Age of the Mobile Internet, INFORMATION TECHNOLOGY & INNOVATION FOUNDATION, Washington D.C., May 17, 2011.

With or Without Merit, Class Certification Requires Commonality, ABA SECTION OF ANTITRUST LAW 59TH ANNUAL SPRING MEETING, Washington, D.C., Mar. 30, 2011.

4th Annual Future of Private Antitrust Enforcement Conference, AMERICAN ANTITRUST INSTITUTE, Washington, D.C., Dec. 7, 2010.

Jobs and Technology, NEW DEMOCRATIC LEADERSHIP COUNCIL, Washington, D.C., Sept. 22, 2010.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Regulation and Broadband, ADVANCED COMMUNICATIONS LAW & POLICY INSTITUTE, NEW YORK LAW SCHOOL, New York, N.Y., July 14, 2010.

13th Annual Symposium on Antitrust, GEORGE MASON LAW REVIEW, Washington, D.C., Feb. 4, 2010.

Broadband Infrastructure and Net Neutrality, ADVISORY COMMITTEE TO THE CONGRESSIONAL INTERNET CAUCUS' STATE OF THE NET, Washington, D.C., Jan. 22, 2010.

The Consequences of Net Neutrality Regulations, AMERICAN CONSUMER INSTITUTE CENTER FOR CITIZEN RESEARCH, Washington, D.C., Nov. 19, 2009.

Wireless Innovation Luncheon, MOBILE FUTURE, Washington, D.C., Nov. 3, 2009.

Second Life Settlements & Longevity Summit, INSURANCE-LINKED SECURITIES & LIFE SETTLEMENTS, New York, N.Y., Sept. 30, 2009.

Perspectives on Investment and a National Broadband Plan, AMERICAN CONSUMER INSTITUTE, Washington, D.C., Sept. 4, 2009.

Markets and Regulation: How Do We Best Serve Customers?, Wireless U. Communications Policy Seminar, UNIVERSITY OF FLORIDA PUBLIC UTILITY RESEARCH CENTER, Tampa, FL., Nov. 13, 2008.

The Price Of Medical Technology: Are We Getting What We Pay For? HEALTH AFFAIRS BRIEFING, Washington, D.C., Nov. 10, 2008.

Standard Setting and Patent Pools, LAW SEMINARS INTERNATIONAL, Arlington, VA., Oct. 3, 2008.

The Changing Structure of the Telecommunications Industry and the New Role of Regulation, INTERNATIONAL TELECOMMUNICATIONS SOCIETY BIENNIAL CONFERENCE, Montreal, Canada, June 26, 2008.

The Debate Over Network Management: An Economic Perspective, AMERICAN ENTERPRISE INSTITUTE CENTER FOR

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

REGULATORY AND MARKET STUDIES, Washington, D.C., Apr. 2, 2008.

Merger Policy in High-Tech Industries, GEORGE MASON UNIVERSITY SCHOOL OF LAW, Washington, D.C., Feb. 1, 2008.

Telecommunications Symposium, U.S. DEPARTMENT OF JUSTICE ANTITRUST DIVISION, Washington, D.C., Nov. 29, 2007.

Wireless Practice Luncheon, FEDERAL COMMUNICATIONS BAR ASSOCIATION, Washington, D.C., Nov. 29, 2007.

Association for Computing Machinery's Net Neutrality Symposium, GEORGE WASHINGTON UNIVERSITY, Washington, D.C., Nov. 12, 2007.

Regulators' AdvanceComm Summit, NEW YORK LAW SCHOOL, New York, N.Y., Oct. 14, 2007.

Annual Conference, CAPACITY USA 2007, New York, N.Y., Jun. 26, 2007.

William Pitt Debating Union, UNIVERSITY OF PITTSBURGH, SCHOOL OF ARTS & SCIENCES, Pittsburgh, PA., Feb. 23, 2007.

Annual Conference, WIRELESS COMMUNICATIONS ASSOCIATION INTERNATIONAL, Washington, D.C., June 27, 2006.

Annual Conference, MEDICAL DEVICE MANUFACTURERS ASSOCIATION, Washington, D.C., June 14, 2006.

Annual Conference, ASSOCIATION FOR ADVANCED LIFE UNDERWRITING, Washington, D.C., May 1, 2006.

Entrepreneur Lecture Series, LAFAYETTE COLLEGE, Easton, PA., Nov. 14, 2005.

Editorials and Magazine Articles

The Future of Net Neutrality: What Will the Court Decide, FOREIGN AFFAIRS, Mar. 16, 2016, co-authored with Robert Litan.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Obama's Big Ideas for Small Saves: 'Robo' Financial Advice, WALL STREET JOURNAL, July 21, 2015, co-authored with Robert Litan.

How the FCC Will Wreck the Internet, WALL STREET JOURNAL, May 28, 2015

The FCC's Incentive Auction: Getting Spectrum Right, PROGRESSIVE POLICY INSTITUTE PAPER, Nov. 2013.

Clash of the Titans: How the Largest Commercial Websites Got That Way, MILKEN INSTITUTE REVIEW, Second Quarter 2013, co-authored with Robert Hahn.

Wireless Competition: An Update, GEORGETOWN CENTER FOR BUSINESS AND PUBLIC POLICY ECONOMIC POLICY VIGNETTES, May 3, 2012, co-authored with Robert Hahn.

Book Review of Tim Wu's The Master Switch, MILKEN INSTITUTE REVIEW, January 2012.

The AT&T/T-Mobile Deal: Should We Fear Wireless Consolidation? FORBES, June 3, 2011.

In FCC's Report on Wireless Competition, an Agenda?, HARVARD BUSINESS REVIEW, Apr. 15, 2011, co-authored with Gerald Faulhaber.

Will the Proposed Banking Settlement Have Unintended Consequences? HARVARD BUSINESS REVIEW, Mar. 29, 2010, co-authored with Joseph R. Mason.

Should Regulators Block AT&T's Acquisition of T-Mobile?, HARVARD BUSINESS REVIEW, Mar. 22, 2010.

The Black Hole in America's Retirement Savings, FORBES, Dec. 21, 2010, co-authored with Robert Litan.

Broken Compensation Structures and Health Care Costs, HARVARD BUSINESS REVIEW, Oct. 6, 2010, co-authored with Robert Litan.

Why Net Neutrality Is Bad for Business, HARVARD BUSINESS REVIEW, Aug. 13, 2010, co-authored with Robert Litan.

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

-196-

Why the iPhone Won't Last Forever and What the Government Should (or Shouldn't) Do to Promote Its Successor, MILKEN INSTITUTE REVIEW (First Quarter 2010), co-authored with Robert W. Hahn.

Streamlining Consumer Financial Protection, THE HILL, Oct. 13, 2009, co-authored with Joseph R. Mason.

Foxes in the Henhouse: FCC Regulation through Merger Review, MILKEN INSTITUTE REVIEW (First Quarter 2008), co-authored with J. Gregory Sidak.

Don't Drink the CAFE Kool-Aid, WALL STREET JOURNAL, Sept. 6, 2007, at A17, co-authored with Robert W. Crandall.

The Knee-Jerk Reaction: Misunderstanding the XM/Sirius Merger, WASHINGTON TIMES, Aug. 24, 2007, at A19, co-authored with J. Gregory Sidak.

Net Neutrality: A Radical Form of Non-Discrimination, REGULATION, Summer 2007.

Telecom Time Warp, WALL STREET JOURNAL, July 11, 2007, at A15, co-authored with Robert W. Crandall.

Earmarked Airwaves, WASHINGTON POST, June 27, 2007, at A19, co-authored with Robert W. Hahn.

Not Neutrality, NATIONAL POST, Mar. 29, 2007, at FP19.

Should ATM Fees Be Regulated?, NATIONAL POST, Mar. 8, 2007, at FP17, co-authored with Robert W. Crandall.

Life Support for ISPs, REGULATION, Fall 2005, co-authored with Robert W. Crandall.

No Two-Tier Telecommunications, NATIONAL POST, Mar. 7, 2003, at FP15, co-authored with Robert W. Crandall.

Memberships

American Economics Association

American Bar Association Section of Antitrust Law

Reviewer

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

-197-

Journal of Risk and Insurance

Journal of Competition Law and Economics

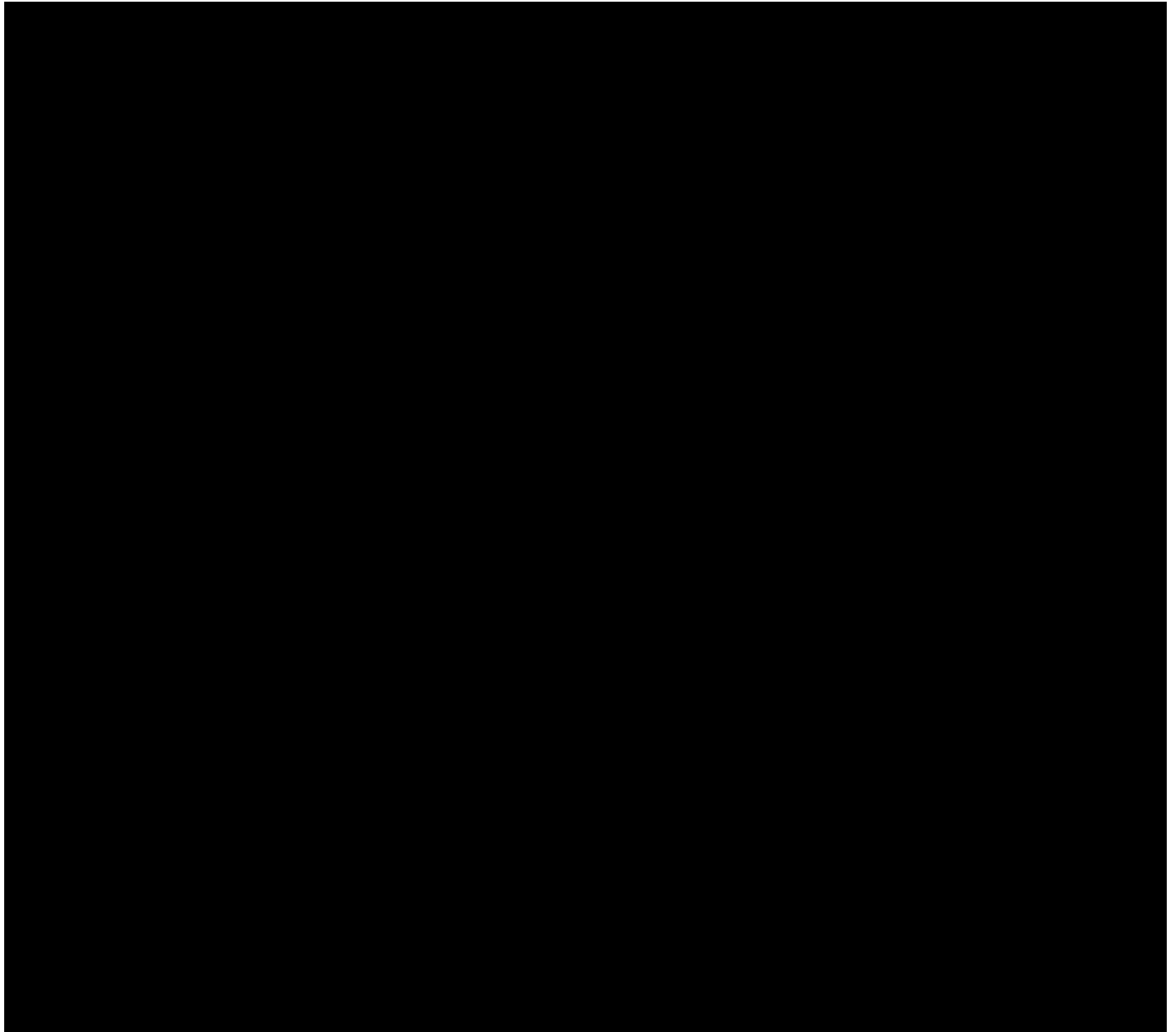
Journal of Risk Management and Insurance Review

Journal of Regulatory Economics

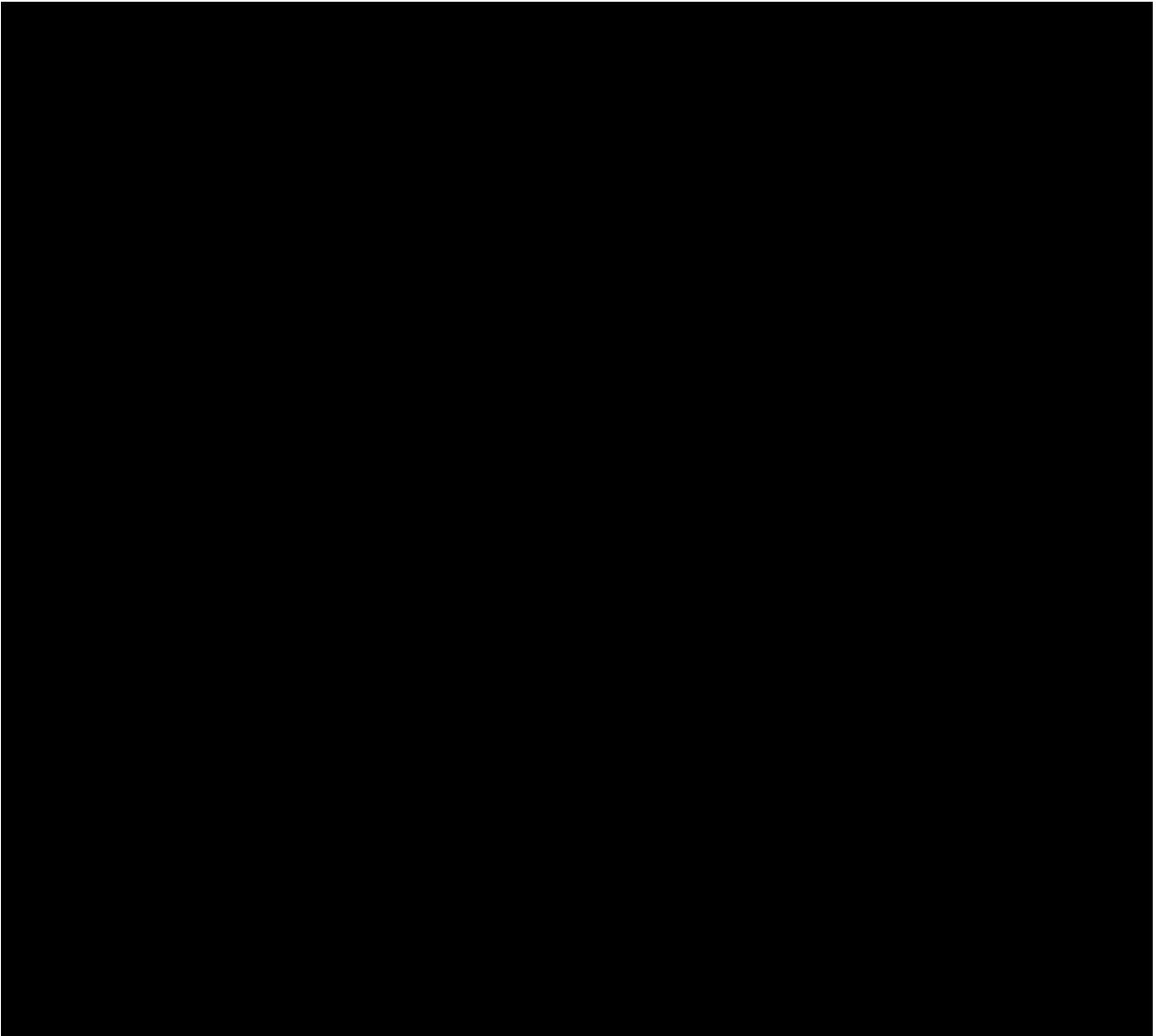
Managerial and Decision Economics

Telecommunications Policy

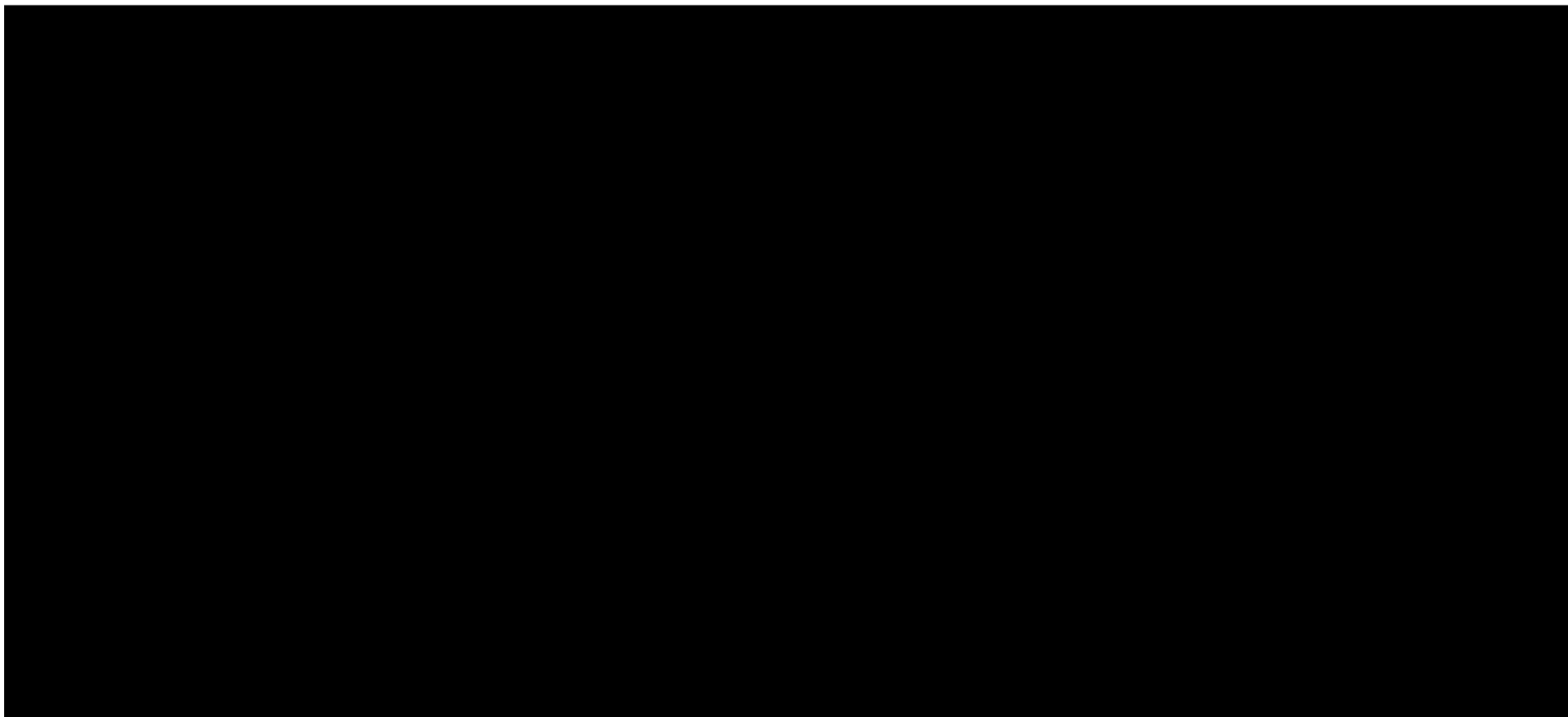
HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER



HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER



HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER



HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

APPENDIX: MATERIALS RELIED UPON

Deposition of Jeffrey Aronson, April 25, 2017

Deposition of Robert Arum, October 17, 2017

Deposition of Denitza Batchvarova, January 25, 2017

Deposition of Roger Blair, December 8-December 9, 2017

Deposition of Scott Coker, August 3, 2017

Deposition of Louis John DiBella, August 29, 2017

Deposition of Ike Lawrence Epstein, December 2, 2016

Deposition of Lorenzo Fertitta, March 23, 2017

Deposition of Kirk Hendrick, November 29-November 30, 2016

Deposition of Leon Margules, July 11 2017

Deposition of Michael Mersch, July 14, 2017

Deposition of Kurt Otto, February 6, 2017

Deposition of Paul Oyer, November 29, 2017

Deposition of Sean Shelby, April 12, 2017

Deposition of Carlos Silva, April 18, 2017

Deposition of Joseph Silva, June 7, 2017

Deposition of Robert Topel, December 5-December 6, 2017

Deposition of Dana White, August 9-August 10, 2017

Expert Report of Robert H. Topel, Ph.D., Cung Le, et al., v. Zuffa, LLC d/b/a Ultimate Fighting Championship and UFC, Case No. 2:15-cv-01045-RFB-PAL (D.Nev.) (October 27, 2017)

Expert Report of Paul Oyer, Ph.D., Cung Le, et al., v. Zuffa, LLC d/b/a Ultimate Fighting Championship and UFC, Case No. 2:15-cv-01045-RFB-PAL (D.Nev.) (October 27, 2017)

Expert Report of Roger D. Blair, Ph.D., Cung Le, et al., v. Zuffa, LLC d/b/a Ultimate Fighting Championship and UFC, Case No. 2:15-cv-01045-RFB-PAL (D.Nev.) (November 15, 2017)

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

PUBLIC COPY - REDACTED

Expert Report of Elizabeth Kroger Davis, Cung Le, et al., v. Zuffa, LLC d/b/a Ultimate Fighting Championship and UFC, Case No. 2:15-cv-01045-RFB-PAL (D.Nev.) (October 27, 2017)

Expert Report of Hal J. Singer, Ph.D., Cung Le, et al., v. Zuffa, LLC d/b/a Ultimate Fighting Championship and UFC, Case No. 2:15-cv-01045-RFB-PAL (D.Nev.) (August 31, 2017)

Literature

ABA SECTION OF ANTITRUST LAW, PROVING ANTITRUST DAMAGES 179 (2nd ed. 2010)

Fredrik Anderson, Simon Burgess, & Julia Lane, *Cities, Matching and the Productivity Gains of Agglomeration*, 61(1) JOURNAL OF URBAN ECONOMICS 112-128 (2007)

PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION 737 (4th ed. 2017)

David Autor, David Dorn, Lawrence Katz, Christina Patterson, & John Van Reenen, *Concentrating on the Fall of the Labor Share*, 107(5) AMERICAN ECONOMIC REVIEW: PAPERS & PROCEEDINGS 180-85 (2017)

David Autor, David Dorn, Lawrence Katz, Christina Patterson, & John Van Reenen, *The Fall of the Labor Share and the Rise of Superstar Firms*, Working Paper (May 1, 2017), available at <https://economics.mit.edu/files/12979>

Jesse Baker & Matthew Thomson, *The Ultimate Fighting Championships (UFC): The Evolution of a Sport*, in CASES IN MARKETING MANAGEMENT 110-114 (Kenneth E. Clow & Donald Baack eds., 2012)

Simcha Barkai, *Declining Labor and Capital Shares*, University of Chicago Working Paper (November 2016), available at <https://research.chicagobooth.edu/~media/5872fbef104245909b8f0ae8a84486c9.pdf>

David Berri, Michael Leeds, & Peter von Allmen, *Salary Determination in the Presence of Fixed Revenues*, 10(1) INTERNATIONAL JOURNAL OF SPORT FINANCE 5-25, 6 (2015)

ROGER BLAIR, SPORTS ECONOMICS 354 (Cambridge University Press 2012)

David Blanchflower, Andrew Oswald, & Peter Sanfey, *Wages, Profits, and Rent-Sharing*, 111(1) THE QUARTERLY JOURNAL OF ECONOMICS 227-251 (1996)

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

John Charles Bradbury, *What is Right with Scully Estimates of a Player's Marginal Revenue Product*, 14(1) JOURNAL OF SPORTS ECONOMICS 87-96, 93 (2013)

David Card, Francesco Devicienti, & Agata Maida, *Rent-sharing, Holdup, and Wages: Evidence from Matched Panel Data*, 81(1) REVIEW OF ECONOMIC STUDIES 84-111 (2014)

DENNIS CARLTON & JEFFREY PERLOFF, MODERN INDUSTRIAL ORGANIZATION (Pearson 4th ed. 2005)

James Cassing & Richard W. Douglas, *Implications of the Auction Mechanism in Baseball's Free Agent Draft*, 47(1) SOUTHERN ECONOMIC JOURNAL 110-121 (1980)

Kevin Caves & Hal Singer, *Analyzing High-Tech Employee: The Dos and Don'ts of Proving (and Disproving) Classwide Antitrust Impact in Wage Suppression Cases*, 14(3) ANTITRUST SOURCE (2015)

Kevin Caves & Hal Singer, *Applied Econometrics: When Can an Omitted Variable Invalidate a Regression?* THE ANTITRUST SOURCE 1-9 (December 2017)

Louis N. Christofides & Andrew J. Oswald, *Real Wage Determination and Rent-Sharing in Collective Bargaining Agreements*, 107(3) THE QUARTERLY JOURNAL OF ECONOMICS 985-1002 (1992)

Gregory S. Crawford, *Cable Regulation in the Internet Era*, in ECONOMIC REGULATION AND ITS REFORM: WHAT HAVE WE LEARNED? Ch. 3 (Nancy L. Rose ed., University of Chicago Press 2014)

Jan De Loecker & Jan Eeckhou, *The Rise of Market Power and the Macroeconomic Implications*, Working Paper (August 24, 2017), available at <http://www.nber.org/papers/w23687>

Sabien Dobbelaere & Jacques Mairesse, *Panel Data Estimates of the Production Function and Product and Labor Market Imperfections*, 28 JOURNAL OF APPLIED ECONOMETRICS 1-46, 1 (2013)

Einer Elhauge, *Defining Better Monopolization Standards*, 56(2) STANFORD LAW REVIEW 172 (2003)

Michael W.L. Elsby, Bart Hobijn, & Aysegul Sahin, *The Decline of the U.S. Labor Share*, Brookings Papers on Economic Activity 1-42 (2013)

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

FEDERAL JUDICIAL CENTER, REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 320 (National Academies Press 3rd ed. 2011)

RODNEY D. FORT, SPORTS ECONOMICS 206 (Prentice Hall 3rd ed. 2011)

Rodney D. Fort & Roger G. Noll, *Pay and Performance in Baseball: Modeling Regulars, Reserves and Expansion*, California Institute of Technology Social Science Working Paper 527 (May 1984), available at <https://authors.library.caltech.edu/81597/1/sswp527.pdf>

M.L. Freedman, *Preference-based Sorting and Matching in Industrial Clusters* (Cornell University 2009)

Xavier Gabaix & David Laibson, *Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets*, 121 QUARTERLY JOURNAL OF ECONOMICS 505-540 (2006)

Luis Garicano & Thomas Hubbard, *Managerial Leverage is Limited by the Extent of the Market: Hierarchies, Specialization, and the Utilization of Lawyers' Human Capital*, 50(1) THE JOURNAL OF LAW AND ECONOMICS 1-43 (2007)

Luis Garicano & Thomas Hubbard, *Specialization, Firms, and Markets: The Division of Labor Within and Between Law Firms*, 25(2) THE JOURNAL OF LAW, ECONOMICS, & ORGANIZATION 339-371 (2008)

Mark J. Garmaise, *Ties that Truly Bind: Non-competition Agreements, Executive Compensation and Firm Investment*, 27 J. OF LAW, ECON. AND ORG. 376 (Aug. 2011)

Ronald J. Gilson, *The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128, and Covenants Not To Compete*, 74 NEW YORK UNIV. L. R. 575 (Jun. 1999)

Gene Grossman & Alan Krueger, *Economic Growth and the Environment*, 110(2) QUARTERLY JOURNAL OF ECONOMICS 353-377 (1995)

James R. Hill & William Spellman, *Professional Baseball: The Reserve Clause and Salary Structure*, 22(1) INDUSTRIAL RELATIONS 1-19 (1983)

Barry Hirsch, *Unions, Dynamism, and Economic Performance*, in MICHAEL WACHTER AND CYNTHIA ESTLUND, EDS., RESEARCH HANDBOOK ON THE ECONOMICS OF LABOR AND EMPLOYMENT LAW (Edward Elgar Series of Research Handbooks in Law and Economics) (2012)

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Ira Horowitz, *Sports Broadcasting*, in GOVERNMENT AND THE SPORTS BUSINESS, 275-323 (Roger G. Noll ed., Brookings Institution, 1974)

THOMAS HYCLAK, GERAINT JOHNES, & ROBERT THORNTON, FUNDAMENTALS OF LABOR ECONOMICS 211 (Cengage 2nd ed. 2012)

Lawrence Kahn, *The Sports Business as a Labor Market Laboratory*, 14(3) JOURNAL OF ECONOMIC PERSPECTIVES 75-94, (2000)

Nicholas Kaldor, *Capital Accumulation and Economic Growth*, in THE THEORY OF CAPITAL 177-222 (F.A. Lutz and D.C. Hague eds., St. Martin's Press 1961)

Loukas Karabarbounis & Brent Neiman, *The Global Decline of the Labor Share*, 129(1) QUARTERLY JOURNAL OF ECONOMICS 61-103 (2014)

MICHAEL KATZ & HARVEY ROSEN, MICROECONOMICS (Irwin McGraw-Hill 3rd ed. 1998)

Patrick Kline, Neviana Petkova, Heidi Williams & Owen Zidar, *Who Profits from Patents? Rent-Sharing at Innovative Firms*, IRLE Working Paper #107-17 (September 2017)

Anthony Krautmann, *What's wrong with Scully-Estimates of a Player's Marginal Revenue Product* 37(2) ECONOMIC INQUIRY 369-381 (1999)

Alan Manning, *Imperfect Competition in the Labor Market*, in THE HANDBOOK OF LABOR ECONOMICS IV, CH. 11 (Orley Ashenfelter & David Card eds., 2011)

Richard McGowan & John Mahon, *Demand for the Ultimate Fighting Championship: An Econometric Analysis of PPV Buy Rates*, 6(6) JOURNAL OF BUSINESS AND ECONOMICS 1032-1056, (2015)

A. Douglas Melamed, *Exclusionary Conduct under the Antitrust Laws: Balancing, Sacrifice, and Refusals to Deal*, 20(2) BERKELEY TECH LAW JOURNAL 1248-66, 54 (March 2005), available at <http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1579&context=btlj>

James Monks, *Revenue Shares and Monopolistic Behavior in Intercollegiate Athletics*, Cornell Higher Education Research Institute Working Paper 155 (September 2013), at 2-3, available at <https://www.ilr.cornell.edu/sites/ilr.cornell.edu/files/WP155.pdf>

Kevin Murphy & Robert Topel, *The Economics of NFL Team Ownership* (undated)

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Roger G. Noll, *Attendance and Price Setting*, in GOVERNMENT AND THE SPORTS BUSINESS, 115-157 (Roger G. Noll ed., Brookings Institution 1974)

Roger G. Noll, *The Economics of Sports Leagues*, in LAW OF PROFESSIONAL AND AMATEUR SPORTS (Gary A. Uberstine ed., Clark Boardman 1988)

Paul Oyer & Scott Schaefer, *Personnel Economics: Hiring and Incentives*, in in THE HANDBOOK OF LABOR ECONOMICS IV, CH. 20 (Orley Ashenfelter & David Card eds., 2011)

ROBERT PINDYCK & DANIEL RUBINFELD, MICROECONOMICS 549 (Pearson 8th ed. 2013).

ROBERT PINDYCK & DANIEL RUBINFELD, ECONOMETRIC MODELS AND ECONOMIC FORECASTS 117-119 (McGraw-Hill 3rd ed. 1991)

Henry J. Raimondo, *Free Agent's Impact on the Labor Market for Baseball Players*, 4(2) JOURNAL OF LABOR RESEARCH 183-93 (1983)

LIBBY RITTENBERG & TIMOTHY TREGARTHEN, PRINCIPLES OF MICROECONOMICS 356 (Flat World Knowledge 2009)

Matthew Rognlie, *Deciphering the Fall and Rise in the Net Capital Share: Accumulation or Scarcity?*, Brookings Papers on Economic Activity, 1-69 (2015)

ROY RUFFIN & PAUL GREGORY, PRINCIPLES OF MICROECONOMICS 331-36 (Harper Collins 5th ed. 1993)

Steven C. Salop, *The Raising Rivals' Cost Foreclosure Paradigm, Conditional Pricing Practices and the Flawed Incremental Price-Cost Test*, 81(2) ANTITRUST LAW JOURNAL 371-421, 374 (2017)

Sampsa Samila & Olav Sorenson, *Noncompete Covenants: Incentives to Innovate or Impediments to Growth*, 57 MANAGEMENT SCIENCE 425-38 (2011)

Gerald W. Scully, *Binding Salary Arbitration in Major League Baseball*, 21(3) AMERICAN BEHAVIORAL SCIENTIST 431-450 (1978)

GERALD W. SCULLY, THE BUSINESS OF MAJOR LEAGUE BASEBALL CH. 8 (University of Chicago Press 1989)

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Gerald W. Scully, *Pay and Performance in Major League Baseball*, 64(6) THE AMERICAN ECONOMIC REVIEW 915-930 (1974)

Gerald W. Scully, *Player Salary Share and the Distribution of Player Earnings*, 25(2) MANAGERIAL AND DECISION ECONOMICS 77-86 (2004)

Kent Smetters, *Is the Social Security Trust Fund a Store of Value?*, 94(2) THE AMERICAN ECONOMIC REVIEW 176-181, 180 (2004)

ROBERT S. SMITH, MODERN LABOR ECONOMICS: THEORY AND PUBLIC POLICY 61 (9th ed. 2006)

Paul M. Sommers & Noel Quinton, *Pay and Performance in Major League Baseball: The Case of the First Family of Free Agents*, 17(3) THE JOURNAL OF HUMAN RESOURCES, 426-436 (1982)

John Twomey & James Monks, *Monopsony and Salary Suppression: The Case of Major League Soccer in the United States*, 56(1) THE AMERICAN ECONOMIST 20-28 (2011)

John Vrooman, *The Economic Structure of the NFL*, in THE ECONOMICS OF THE NATIONAL FOOTBALL LEAGUE: THE STATE OF THE ART 22-25, 29 (Kevin G. Quinn ed., Springer 2012)

John Vrooman, *Theory of the Perfect Game: Competitive Balance in Monopoly Sports Leagues*, 34(1) REVIEW OF INDUSTRIAL ORGANIZATION 5-44, 42 (2009)

Christopher H. Wheeler, *Search, Sorting, and Urban Agglomeration*, 19(4) JOURNAL OF LABOR ECONOMICS 879-899 (2001)

JEFFREY WOOLDRIDGE, INTRODUCTORY ECONOMETRICS: A MODERN APPROACH (Thompson 4th ed. 2009)

ANDREW ZIMBALIST, BASEBALL AND BILLIONS (Basic Books 1992)

TRIAL MATERIALS/BATES DOCUMENTS

DB-ZUFFA-00006389 DB Credit Finance Report

SBPCL00002101

WME-ZUFFA-0001150

ZFL – 2648535

ZFL-0393217

ZFL-0393223

ZFL-0393226

ZFL-0393229

ZFL-0393238

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

ZFL-0876778
ZFL-0997885 (Batchvarova Exhibit 95)
ZFL-1009561
ZFL-1212232
ZFL-1472338
ZFL-1484034-37
ZFL-1904802
ZFL-2242629
ZFL-2253232
ZFL-2463304
ZFL-2535978
ZFL-2677898-7967
ZFL-2699678
ZFL-2642993
ZFL-2699687
ZUF-00031973
ZUF-00162329
ZUF-00337760

PUBLICLY AVAILABLE MATERIALS

Shaun Al-Shatti, *Scott Coker: Paul Daley vs. Michael Page planned for early 2018, 'MVP' to box in interim*, MMA FIGHTING (July 4, 2017), at <https://www.mmafighting.com/2017/7/4/15882564/scott-coker-paul-daley-vs-michael-page-planned-for-early-2018-mvp-to-box-in-interim>

David H. Autor, *Curriculum Vitae*, available at <https://economics.mit.edu/faculty/dautor/cv>, accessed 1/3/2018

Bellator letter to Congress re Ali Act (Testimony of Tracey Lesetar-Smith Bellator MMA) available at <http://docs.house.gov/meetings/IF/IF17/20171109/106604/HHRG-115-IF17-20171109-SD011.pdf>

Omri Ben-Shahar, *California Got It Right: Ban The Non-Compete Agreements*, FORBES (Oct. 27, 2016) available at <https://www.forbes.com/sites/omribenshahar/2016/10/27/california-got-it-right-ban-the-non-compete-agreements>

Mike Bohn, *Bellator's Joe Schilling signs with GLORY, plans kickboxing and MMA in 2015*, MMA JUNKIE (Jan. 7, 2015), at <http://mmajunkie.com/2015/01/bellators-joe-schilling-signs-with-glory-plans-kickboxing-and-mma-in-2015>

Mike Bohn, *UFC President Dana White: If you're not a 'big pay-per-view star, shut up and fight,'* MMAJunkie (March 4, 2017), at <http://mmajunkie.com/2017/03/ufc-president-dana-white-if-youre-not-a-big-pay-per-view-star-shut-up-and-fight>

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Business Dictionary, *full time equivalent*, at <http://www.businessdictionary.com/definition/full-time-equivalent-FTE.html>

Cage Potato, *Scott Coker Talks Co-Promotion and Negotiations with Fedor, But is Conspicuously Mum About CBS Negotiations* (Undated), at <http://www.cagepotato.com/scott-coker-talks-co-promotion-and-negotiations-fedor-conspicuously-mum-about-cbs-negotiations/>

Mike Chiappetta, *'The Grass Is Greener': UFC-to-Bellator Signees Speak Out*, Bleacher Report (April 5, 2016), at <http://bleacherreport.com/articles/2630256-the-grass-is-greener-ufc-to-bellator-signees-speak-out>

DIRECTV Interview with Dana White (undated), at http://www.directv.com/see/landing/pride_interview.html

Paul Dollery, *An Olympic gold medallist, 'King Mo' and a big night in Dublin for Irish MMA*, The 42 (Dec. 16, 2016), at <http://www.the42.ie/bellator-169-bamma-27-preview-3141650-Dec2016/>

Eastman Kodak Co. v. Image Technical Servs., 504 U.S. 451, 483 & n.32 (1992)

Jim Edwards, *Scott Coker Talks Bellator Going to Ireland, Poland, Brazil, KSW and ACB*, CHAMPIONS.CO (May 18, 2017), at <https://champions.co/p/scott-coker-talks-bellator-ireland-poland-brazil-ksw-acb/4272912>

ESPN, *Power Rankings*, at <http://www.espn.com/mma/rankings>

Mike Fagan, *The Week in Quotes: December 27th-January 2nd*, Bloody Elbow, January 3, 2009, at <https://www.bloodyelbow.com/2009/1/3/708095/the-week-in-quotes-decembe>

Fight Matrix, *FAQ*, at <http://www.fightmatrix.com/faq/>

Gary Herman, *UFC is no longer interested in Andrei Arlovski*, Five Ounces of Pain (July 30, 2009), at <http://www.fiveouncesofpain.com/2009/07/30/ufc-is-no-longer-interested-in-andrei-arlovski/>

In re Air Cargo Shipping Servs. Antitrust Litig., No. 06-MD-1775 JG VVP, 2014 WL 7882100 (E.D.N.Y. Oct. 15, 2014)

Johnson v. Ariz. Hosp. & Healthcare Ass'n (AzHHA), No. CV 07-1292-PHXSRB, 2009 WL 5031334 (D. Ariz. July 14, 2009)

Noah Kirsch, *Exclusive: Billionaire Fertitta Brothers Sell Remaining UFC Stakes at \$5 Billion Valuation*, Forbes (September 7, 2017), at <https://www.forbes.com/sites/noahkirsch/2017/09/07/exclusive-billionaire-fertitta-brothers-sell-remaining-ufc-stakes-at-5-billion-valuation/#71960a604d69>

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Letter to CBS News by Nick Lembo, New Jersey Deputy Attorney General and the Counsel to the New Jersey State Athletic Control Board (December 15, 2006), *available at* <http://www.mmaweekly.com/new-jersey-commission-corrects-60-minutes-story-2>

Steven Marrocco, *Andrei Arlovski released from WSOF, signs with UFC for targeted bout with Schaub*, MMAJunkie, April 24, 2014, at <http://mmajunkie.com/2014/04/andre-arlovski-released-from-wsof-signs-with-ufc-for-targeted-bout-with-brendan-schaub>

Damon Martin, *Dana White defends fighter pay: 'In this sport you eat what you kill,'* FOX Sports (November 15, 2016), at <https://www.foxsports.com/ufc/story/dana-white-defends-fighter-pay-in-this-sport-you-eat-what-you-kill-092616>

Mixed Martial Arts, *Carlos Newton "The Ronin,"* at <http://www.mixedmartialarts.com/fighter/Carlos-Newton:AF8B7F51248A75F7>

MMA Mania, *ProElite and DREAM form new promotional partnership and fighter exchange program*, SB Nation (January 18, 2012), at <https://www.mmamania.com/2012/1/18/2715790/proelite-dream-co-promotion-partnership-ufc>

MMAJunkie, *USA TODAY Sports/MMAjunkie MMA rankings*, at <http://mmajunkie.com/rankings>

MMAJunkie, *MMA Rankings*, at <http://mmajunkie.com/category/mma-rankings>.

Teddy Montemayor & John Bieschke, *How the UFC and Reebok Changed the Sponsorship Landscape in MMA*, MMA Newline (January 9, 2017), at <http://www.mmanewline.com/how-ufc-and-reebok-changed-sponsorship-landscape-in-mma/>

John Morgan, *Strikeforce CEO Scott Coker Predicts Dream Co-Promotion in Relatively Short Time*, MMA Junkie (August 17, 2009), at <http://mmajunkie.com/2009/08/strikeforce-ceo-scott-coker-predicts-dream-co-promotion-in-relatively-short-time>

Order Granting Plaintiffs' Supplemental Motion for Class Certification, High-Tech Employee Antitrust Litig., No. 11-CV-02509 (N.D. Cal. Oct. 24, 2013), at 60-61

PR Newswire, *Professional Fighters League Announces World's Only Mixed Martial Arts League*, (April 19, 2017), at: <https://www.prnewswire.com/news-releases/professional-fighters-league-announces-worlds-only-mixed-martial-arts-league-300441555.html>

Primal Fight League, *Scott Coker open to five-round main events, Michael Page vs. Paul Daley 'winner takes all' match* (Oct. 24, 2017), at <https://primalfightleague.com/scott-coker-open-to-five-round-main-events-michael-page-vs-paul-daley-winner-takes-all-match/>

Tommy Rojas, *Dana White UFC President Interview* (2001), at <http://www.primetimefighters.net/interview2.htm>

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Trent Reinsmith, *UFC's Dana White Says Floyd Mayweather-Conor McGregor Boxing Match Sold 6.7 Million PPVs*, Forbes (Oct. 25, 2017), at <https://www.forbes.com/sites/trentreinsmith/2017/10/25/ufc-president-dana-white-says-floyd-mayweather-vs-conor-mcgregor-boxing-match-sold-6-7-million-ppv/>

Steven Rondina, *Bleacher Report MMA Rankings for September 2016 Ahead of UFC 203*, Bleacher Report (September 6, 2016), at <http://bleacherreport.com/articles/2661894-bleacher-report-mma-rankings-for-september-2016-ahead-of-ufc-203>

Sherdog, *Absolute Championship Berkut*, at <http://www.sherdog.com/organizations/Absolute-Championship-Berkut-8185>

Sherdog, *Dream, One FC Form Alliance, Plan March 31 Co-Promotion*, (November 28, 2011), at <http://www.sherdog.com/news/news/Dream-One-FC-Form-Alliance-Plan-March-31-CoPromotion-37500>

Sherdog, *Strikeforce*, at <http://www.sherdog.com/organizations/Strikeforce-716>

Jon Show, *Strikeforce builds a following in the shadows of the UFC*, Sports Business Journal (October 12, 2009), at <http://sportsbusinessdaily.com/Journal/Issues/2009/10/20091012/SBJ-In-Depth/Strikeforce-Builds-A-Following-In-The-Shadows-Of-The-UFC.aspx>

Jonathan Snowden, *UFC 118 Preview: Dana White Brings Back the Zuffa Myth for an Ignorant Boston Press*, Bloody Elbow (August 26, 2010), at <https://www.bloodyelbow.com/2010/8/26/1651748/ufc-118-preview-dana-white-brings>

Tapology, *ACB 51: Silva vs. Torgeson*, at <https://www.tapology.com/fightcenter/events/43182-absolute-championship-berkut-51>

Tapology, *ACB 72: Makovsky vs. Sherbatov*, at <https://www.tapology.com/fightcenter/events/47826-acb-72-makovsky-vs-sherbatov>

Nick Thomas, *Strikeforce open to Bellator co-promotion, Gilbert Melendez vs. Eddie Alvarez: A potential fight*, Bloody Elbow (May 17, 2010), at <https://www.bloodyelbow.com/2010/5/17/1476096/strikeforce-open-to-bellator-co>

Andy Samuelson, *Strikeforce CEO Coker Sees Endless Possibilities*, Las Vegas Sun (August 18, 2009), available at <https://lasvegassun.com/news/2009/aug/18/strikeforce-ceo-coker-sees-endless-possibilities/>

To amend the Professional Boxing Safety Act of 1996 to include fighters of combat sports in the safety provisions of such Act: Hearing on H. R. 44 Before the House Energy and Commerce Subcomm. on Commerce, Manufacturing, and Trade, 115th Cong. (2017), available at <http://docs.house.gov/meetings/IF/IF17/20171109/106604/HHRG-115-IF17-20171109-SD011.pdf>

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER

Ultimate Fighting Championship, *UFC 194: Aldo vs. McGregor*, at <http://www.ufc.com/event/UFC194>

Ultimate Fighting Championship, *UFC 202: Diaz vs. McGregor 2*, at <http://www.ufc.com/event/UFC-202>

Ultimate Fighting Championship, *UFC 205: Alvarez vs. McGregor*, at <http://www.ufc.com/event/ufc-205>

U.S. Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines* (August 19, 2010), available at <https://www.justice.gov/atr/horizontal-merger-guidelines-08192010>

Vogel v. Am. Soc’y of Appraisers, 744 F.2d 598, 601 (7th Cir. 1984)

Bruce Weber, *Gerald W. Scully, Who Wrote Landmark Baseball Analysis, Dies at 67*, New York Times (June 6, 2009), available at <http://www.nytimes.com/2009/06/07/sports/baseball/07scully.html>

Weyerhaeuser Co. v. Ross-Simmons Hardwood Lumber Co., 549 U.S. 312, 322 (2007)

HIGHLY CONFIDENTIAL - UNDER PROTECTIVE ORDER